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The Commonwealth of Massachusetts

ANNUAL REPORT

OF THE

METROPOLITAN DISTRICT COMMISSION

FOR THE YEAR 1936

PUBLICATION OF THIS DOCUMENT APPROVED BY THE COMMISSION ON ADMINISTRATION AND FINANCE

1m-5-37. No. 715.

James J. Storrow Memorial, Charles River, Boston

CONTENTS

REPORT OF THE METROPOLITAN DISTRICT COMMISSION

To the Honorable the Senate and House of Representatives of the Commonwealth of Massachusetts in General Court assembled.

The Metropolitan District Commission has already presented to your Honorable Body an abstract of the account of the receipts, expenditures, disbursements and liabilities of the Metropolitan District Commission for the fiscal year ending on November 30, 1936, and now, in accordance with the provisions of section 100 of chapter 92 of the General Laws, presents a detailed statement of its doings for the calendar year ending on December 31, 1936.

SEVENTEENTH ANNUAL REPORT

I. Organization and Administration

COMMISSION, OFFICERS AND EMPLOYEES

Austin J. O'Connor was appointed Associate Commissioner September 16, 1936 in place of Joseph A. Rourke, who resigned to accept an appointment on the Suffolk Court House Commission. The Commission with this exception remains the same as in the previous year: Eugene C. Hultman, Commissioner, William F. Rogers, Melvin B. Breath, Felix A. Marcella and Austin J. O'Connor, Associate Commissioners.

William E. Whittaker has continued as Secretary of the Commission, William E. Foss as Director and Chief Engineer of the Water Division, Benjamin R. Davis as Director and Chief Engineer of Park Engineering and Joseph P. Dever as Director and Chief Engineer of the Sewer Division.

The total number of permanent positions as of November 30, 1936 and the number of temporary employees during the year is divided as follows:

	Administration	*Parks Division*	*Sewerage Division*	*Water Division*	*Total*
Permanent	44	676*	226†	372	1,318
Temporary	24	831‡	843§	96	1,794
	68	1,507	1,069	468	3,112

* Of this number 12 employees worked part of the year on Mass. State Project D-1, P.W.A. Docket 4478, Wellington Bridge.

†Of this number 14 employees worked on Mass. State Project D-101, P.W.A. Docket 1098-R, Sewerage Division.

‡Of this number 4 employees worked on Mass. State Project D-1, P.W.A. Docket 4478, Wellington Bridge.

§Of this number 258 worked part time on Mass. State Project D-101, P.W.A. Docket 1098-R, Sewerage Division.

II. General Finanial Statement

Year ending November 30, 1936

Expended for construction	$2,104,843.87*
Expended for maintenance	4,146,434.10
Total expenditures	6,251,277.97
Unexpended balance, maintenance appropriations	327,521.33
Serial bonds and notes issued	1,650,000.00
Sinking fund bonds paid	2,365,000.00
Serial bonds and notes paid	583,937.50
Decrease in sinking fund	596,213.68
Decrease in net debt	702,723.82

On November 30, 1936

Net debt	$17,590,098.06

*Of this amount $397,902.75 is for Mass. State Project D-1, Docket 4478, Wellington Bridge.
Of this amount $1,362,774.37 is for Met. Sewerage Const. Fund, North System, Mass. State Project D-101, Docket 1098-R.

III. Parks Division—Construction

Wellington Bridge

The westerly half of Wellington Bridge was open to traffic on August 1, 1936, so that the entire bridge is now in operation. This allowed the Mystic Valley Parkway

from Mystic Avenue to the Fellsway Traffic Circle at Revere Beach Parkway, which had been restricted to one-way traffic, to be opened to travel in both directions. The installation of lighting standards, fixtures and the furnishing of sodium lamps on the bridge have been contracted for and will be completed in the early part of 1937. The completion of the Wellington Bridge, constructed under the authorization of Chapter 365 of the Acts of 1933 as a Public Works Administration Project, is a fine example of a public improvement made possible through Federal aid.

Nahant Beach Improvements

As authorized under Chapter 493 of the Acts of 1935, the work of reconstructing and improving the recreation grounds at Nahant Beach Reservation was started in 1935 and completed in 1936. This work included the building of two tennis courts with sheet asphalt surfaces enclosed with a wire fence; grading, loaming and seeding of two baseball diamonds; furnishing and erecting nine hundred and eighty-eight lineal feet of wire fencing, gates, etc., around the children's playground at Nahant Beach, and installing playground apparatus to care for children up to fourteen years of age; a drinking fountain was also constructed within the enclosure. An instructor was employed during the summer season who supervised about 130,000 children using this area. Only six first-aid cases were treated which were of a very minor nature.

Gravel fill and stone ballast were placed along the bulkhead line at the recreation grounds.

Lynn Shore Reservation

Repairs were made to the sea wall and slope along the Lynn Shore Reservation.

Winthrop Shore Reservation

Repairs were made to the steel work of the Winthrop Shore Bridge of the Boston, Revere Beach and Lynn Railroad.

Revere Beach Parkway

The Revere Beach overpass at Broadway, Revere, was regraded and landscaped. The shrubbery and trees will be planted in 1937.

Charles River Reservation

The driveway to the Police Station at the Charles River Dam was widened to allow the patrol wagon an easy access and exit to the new garage constructed last year.

Harvard Bridge in Boston and Cambridge was painted.

Owing to the excessive flood flow into the Charles River, the outlet of Faneuil Valley Brook Drain had to be dredged and deposits in several portions of the river removed.

Near the Charles River Upper Division headquarters, the cast iron fence was replaced and the concrete wall repaired.

At the Charles River outlet dam, the large boat lock and gates were repaired and reconstructed.

A permanent flood lighting system was installed at the lagoon on the Boston side of the Charles River Basin.

A retaining wall was constructed on the southerly side of Nonantum Road in Newton, and the dike at the Watertown Dam was reconstructed.

A contract was awarded for constructing a boat landing and concrete and granite steps and balustrades on the northerly side of the Charles River near Watertown Square, Watertown.

Moody Street Dam

As authorized under Chapter 448 of the Acts of 1935, title to the Moody Street Dam in Waltham, and the flowage rights of the Upper Charles River were acquired. It is expected that the water level can now be controlled so as to eliminate the low water in the summer time which has affected the use of the river for boating and has caused objectionable odors from the exposed mud flats.

Mystic River Reservation

The Mystic River between Mystic Lake and Auburn Street, Medford was dredged and the material used to improve the shores. A contract for constructing a bridge across the Mystic River at High Street, Medford, and Medford Street, Arlington, with suitable approaches, authorized under Chapter 377 of the Acts of 1936, was started and will be completed in the early part of 1937.

Old Colony Parkway

As authorized under Chapter 147 of the Acts of 1936, the Commission awarded a contract for the construction of a bath house on the westerly side of Old Colony Parkway, Malibu Beach in the Dorchester district of Boston. It is expected that this bath house will be completed and ready for operation in the summer of 1937.

Quincy Shore Reservation

Repairs were made to the concrete and rip-rap at Black Creek's Dam.

RECONSTRUCTION OF PARKWAYS AND BOULEVARDS

The following boulevards and parkways were reconstructed or resurfaced during the year, with some changes in grade and alignments:

Chickatawbut Road in the Blue Hills Reservation, Milton and Quincy, from Unquity Road to Randolph Avenue and Hillside Street, Milton.

From Chickatawbut Road, 3600 feet southwesterly were reconstructed.

A section of Old Colony Parkway, from a point south of Tolman Street to a point near Freeport Street in the Dorchester district of Boston, was regraded and resurfaced.

The Veterans of Foreign Wars Parkway, Boston and Brookline, was resurfaced by covering with one inch of bituminous concrete.

Soldiers Field Road from Western Avenue to North Harvard Street, Brighton district of Boston, was reconstructed.

A section of Charles Bank Road, between Embankment Road and Charles Street, Boston, was reconstructed.

A portion of Memorial Drive, from Mt. Auburn Street, Cambridge, about 600 feet southerly, was reconstructed.

Sections of Lynn Fells Parkway, between Melrose Street and Main Street, near Lincoln Street, Melrose, and a section of Wyoming Avenue from Fellsway East Extension to the Melrose line, Middlesex Fells Reservation, Stoneham, were regraded and resurfaced.

A one-inch bituminous, concrete, seal-coat was placed on the Lynn Fells Parkway from Fellsway East Extension to Tremont Street, Stoneham and Melrose.

The easterly roadway of Middlesex Fells Parkway from Riverside Avenue to the Medford Branch of the Boston and Maine Railroad, was reconstructed.

A cast statuary, bronze tablet was erected on a boulder to mark the Leo M. Birmingham Parkway.

A chain, link fence was furnished and installed at the Moody Street Playground in Waltham.

Borings were made on the shore of the Charles River at Pleasant Street, Watertown, up-stream from Watertown Dam.

Borings were made at the site of the bath house at Malibu Beach.

The deck and approaches of the Larz Anderson Bridge, Charles River Basin, Boston and Cambridge, were regraded and resurfaced.

Granite block paving was repaired and decking bolts renewed on Harvard Bridge, Boston and Cambridge.

A finely finished, cast bronze lamp, similar to the existing lamps on the John W. Weeks Bridge, was furnished and erected on said bridge, including the necessary wiring.

Repairs to lights on Larz Anderson Bridge, John W. Weeks Bridge, Harvard Bridge and Western Avenue Bridge were made.

Repairs to Harvard Bridge and John W. Weeks Bridge, Boston and Cambridge.

The racks of down-stream leaf of drawbridge at the Charles River Dam were repaired.

Two dolphins in the Charles River Basin, were renewed, between Lechmere Canal and Broad Canal, and one dolphin in the Charles River Basin, upstream from the large lock, was repaired.

Repaired gate and hoist at Cradock Bridge, Medford.

Also repaired planking sills and stringers over the tide gates at the northerly half of the Cradock Bridge Dam.

Six borings were made at the site of the Mystic Valley Bridge, High Street, Medford, and six borings were also made at the location of the bridge over the Mystic River and Harvard Avenue and River Street Bridge, Medford and Arlington.

Repairs were made to the Neponset Bridge draw, and the main girders above the railroad track and the faciers of the outside girders of the Pope's Hill Bridge were painted.

The main girders of the Western Division Bridge of the Boston and Maine Railroad, Revere Beach Parkway, were painted.

Installation of traffic control signals were completed at the draw spans of Charles River Dam, Neponset Bridge and Wellington Bridge.

The Administration Building at the Bunker Hill Monument was reroofed.

The accoustic music shell on the Esplanade was erected and painted.

Granite curbing was furnished and set in the Storrow Memorial, Charles River Basin.

Electrical replacements at the Charles River Lock and Draw, Charles River Basin.

Bells were installed to function during the pedestrian period at intersections of Old Colony Parkway with Redfield Street, Tolman Street, Conley Street and Freeport Street.

Changes were made at the junction of Fellsway East and Fellsway West, Malden, by widening the roadway.

Supervised and inspected the building of the refreshment concession at the Nahant parking area, Nahant Beach.

Furnished and installed a new manhole in the bend in the sewer near George Washington Boulevard, Hull.

Changes were made at the corner of Winthrop Avenue and Revere Beach Parkway, Revere, to eliminate a traffic hazard.

Two hundred and fifteen permits were issued for driveway entrances and necessary purposes, and sixty-nine orders concerning restrictions were issued and reported upon.

The Engineering Department has furnished the supervision of all driveway construction work, and all other work relating to permits, and has reported on building operations where violations of restrictions might have been involved.

The work of breaking ice in the channels of the Charles River Basin below Longfellow Bridge, and in the Broad and Lechmere canals was done as required by the Federal Government.

IV. Maintenance of Parks and Reservations

The usual work of maintenance of the parkways and boulevards and the reservations has continued during the year.

Revere Beach Division

The cleaning of walks, gutters and roadways, the removal of debris strewn upon the beaches by the tides, and picking up of rubbish left by visitors at the beaches, places a formidable problem during the summer months in keeping the reservation in an attractive condition. Owing to the decreased electric car fares, there is a large increase in the number of people visiting Revere Beach, which has required a larger maintenance force.

Parking lines for 1,111 automobiles have been painted from Eliot Circle to the North Circle.

The band stand at Beach Street has been repaired, the wall filled and a reinforced concrete floor laid.

Two steam boilers were retubed in pretty good condition.

Water connection with the Northern High Service Pipe Line in Ocean Avenue has been made, which now insures a plentiful supply of water if the Artesian wells should fail.

Two flood lights were installed on the bath house walls to eliminate a dark section of the beach front.

All the buildings were kept in repair, shelters were repainted and directional signs renewed.

Memorial services for soldiers were held on May 22, 1936 at the Beach Street Band Stand.

The widening of Revere Street by the Department of Public Works necessitated the taking of land from the old sanitary lot.

About 2,000 square yards of "Type E" sidewalk and 300 feet of concrete curbing were constructed along the Revere Beach Parkway.

Seventy trees and five hundred shrubs were planted.

Four traffic lanes were painted on the Revere Beach Parkway from Middlesex Fells to Revere, which aided in regulating traffic.

The parkway was seal coated from Medford Avenue to Main Street, Everett; Washington Avenue, Chelsea to Overpass, Revere; and from the North Shore Road to Revere Beach.

Five hundred cubic yards of loam were used in renewing grass areas and two large Austrian pine trees, the gift of Herbert H. Goodwin of Point of Pines, Revere, were planted at Eliot Circle.

On May 17, 1936, the General Edwards Bridge was dedicated to the memory of General Edwards. Five hundred seats were furnished for a reviewing stand, and a large parade of U. S. soldiers and sailors, together with civic organizations, marched over the boulevard to Revere Street.

A flight of 24 stairs were provided to reach the beach from the Winthrop Parkway.

A drinking fountain was installed, the seawall pointed and the road, walks and manholes repaired.

At Nahant Beach six fire places were constructed on the waterfront by the Commission forces, which proved very popular, and were in great demand. The use of these fire places is now restricted to a time limit covered by a permit.

A promenade is now under construction over the old bridle path, which will be 3,300 feet long and 10 feet wide.

About 900 square feet of concrete walks were resurfaced near the bath house at Nahant Beach.

On Sunday, May 24, 1936, the annual memorial services to the Navy dead were held at Red Rock, under Lynn veterans' organizations.

Forty-five trees, eight hundred bulbs and six hundred plants were set out during the year, and one thousand cubic yards of loam was used to repair the grass areas and shrub beds in the Lynn Shore Reservation.

Co-operation is acknowledged to the instructors from the Lynn Park Department, National Council Youth Federation and the Federal Goverment W.P.A. Essex County Recreational Bureau, who were in attendance from May to October; to the Seaside Park Playground and Junior Playground, also to the Lynn Lion's Club who sponsored classes for beginners and advanced stages of swimming at King's Beach and Lynn Beach.

Middlesex Fells Division

Several driveways were widened and resurfaced, bridle paths were repaired and treated extensively, and the several brooks within the reservation were cleaned, deepened and culverts rebuilt. A new drain was laid and the wall around the pond at Nature's Trail was repaired. Owing to the dangerous condition of leaving the so-called Silver Mine opened, a concrete, reinforced cap was constructed over the opening.

A large amount of building repairs was done to the two houses now occupied by Superintendent Woods and Captain Rogers. New wall paper and painting, flooring replaced where needed, electric fixtures replaced, and repairs to the plumbing system. Also a new oil burner was installed in one of the houses. Minor repairs were made to other houses owned by the Commission in this division.

Minor repairs and servicing of motor equipment has been taken care of by the division forces.

Mosquito control ditches on the Mystic marsh were cleaned out over a large area.

The beach at Foster's Court was cleaned, and a matron and two life guards were employed there during the summer season. Considerable repairs were made to the bath house and the concession stand.

The maintenance work necessary to keep the parkway in good repair has continued. Gutters were swept, catch basins cleaned out, grass plots raked and cut, shrub beds weeded and cleaned, and minor repairs made to the roadway. Fences were repaired where needed, signs replaced and traffic lines were repainted.

Three miles of Lynn Fells Parkway was seal-coated with cut-back asphalt and pea stone, between Bellevue Avenue and the Newburyport Turnpike by the division forces.

Sidewalks were repaired in some places and minor patching jobs with asphalt and pea stone were done where needed. A new under-drain and manhole was constructed at the junction of Middlesex Fells Parkway and the Revere Beach Circle, to drain the parkway into the river, as the marsh into which the old drains emptied is being filled in by owners and prepared for future development. A catch basin was built at the corner of Murray Hill Road and Fellsway East.

The junction of Fellsway East and West was improved by cutting back the curbing on the planting space, which necessitated some resurfacing. At Fellsway East from Pond Street, Stoneham to East Border Road, was seal-coated with cut-back asphalt and pea stone for a total length of 1.4 miles. One hundred feet of 12″ drain pipe was laid in Ravine Road, to take care of the surplus drainage water. A ditch 400 feet long was dug alongside Pond Street, of which 200 feet was piped with 12″ pipe, and the remainder left an open graded ditch. This drain will take care of water lodged in swamp pockets on road sides which used to cause the roadway to expand and become very dangerous at times to automobile traffic.

Mystic Valley Parkway was seal-coated with asphalt and pea stone from the Aberjona Bridge to Kilgore Avenue, Medford, a distance of 1⅗ miles.

Winthrop Street Playground was levelled and the grass cut and mowed for a series of cricket games. The sidewalk from the Mystic Shops to Boston Avenue, a distance of 500 feet, was resurfaced. Careful consideration was given to cleaning the beach and sanitaries at the Upper Mystic Lake; repairing life-saving stands, replacing buoys and ladders and repairing washouts along Mystic Lake and the Mystic River. Two life guards were employed during the bathing season at Sandy Beach, Mystic Upper Lake.

In addition to the regular work of cleaning and repairing the Woburn Parkway, about 500 yards of filling was placed in low land on both sides of the road near the ice house. Regular cleaning and minor repairs were made to the Quannapowitt Parkway. In the Malden and Melrose sections of the reservation, about three miles of bridle paths were widened and drainage ditches built.

The work in the Forestry Department has been carried on the past year as follows:

The work of topping and pruning the Carolina Poplars on Fellsway West was completed early in the fall.

The Norway Maples on the Fellsway from Fulton to Salem Streets were also pruned during the summer. This pruning consisted largely of removing limbs which were becoming a menace to traffic, both on the highways and to the Elevated cars. Other tree trimming was also done on Fellsway East along the boundary roads and near the walks in the Fellsmere Park area.

Smaller trees within the division were pruned and staked.

In the wooded sections of the Fells, the low limbs which both interfered with horse back riders and spraying operations, were removed along about five miles of bridle paths.

The grove near Cranberry Pool Road was made more available as a picnic ground. This type of work was also carried on along the nature trail section of Virginia Woods, and also in the New England Sanitarium area.

Brush cutting has been carried on in a limited way with the hope of keeping clear such areas as may be of the greatest use to the public or where the growth would obstruct the view on corners along several of the reservation roads and parkways. This work would probably cover an area of about ten acres and three miles of roadway.

The largest ornamental planting made the past season was at the Mystic River Reservation on the shore drive near Somerville beach. About twenty-five trees and three hundred shrubs were planted, and in accordance with a plan of the landscape consultant, this planting will be completed in the spring of 1937. Another small ornamental planting was made near the junction of Lynn Fells Parkway and Whip Hill Road, and a third planting was completed on a small area of reservation land situated between Youle and Perkins Streets, Melrose.

Forty-five Red Maples were planted at Bear Hill entrance; 4,000 four-year Hemlock transplants were planted on bare sections on the side of Fellsway East; 4,000 four-year Scotch Pine transplants and 6,000 four-year White Pine transplants were planted on burned areas throughout the Fells.

About 3,000 man hours were contributed by the C.C.C. at Breakheart Reservation on insect control, creosoting nests. The infestation of insects the past year was the worst for many years, and seems fair to continue with a heavy increase in the gypsy moth infestation. Spraying operations were carried on along all the reservation roads and along as many of the bridle paths as were passable with the sprayers. A total of nearly nine tons of arsenate of lead was used in this work. Spraying of beech trees infested with the Felt Beech Cap scale was also carried on in isolated areas where infestation occurred. The arsenate of lead spraying was to control the Eastern Tent Caterpillar, Canker Worm, Forest Tent Caterpillar and Gypsy Moths, which occurred in the order named often over the same areas.

The work of removing dead, fallen or dangerous trees was carried on, resulting to a total of approximately ten cords of wood. The Middlesex Fells Reservation was very fortunate in the small number of fires as well as the small area burned. In spite of the extremely dry summer and fall, there was only a total of about twenty brush fires, none of which burned an area of over a few hundred square feet, with the exception of two which covered about three acres each. The damage done was very small as few small trees were growing in the burned areas.

Middlesex Fells Zoo

The Zoo located in the Middlesex Fells on Pond Street, Stoneham, has continued to be the center of attraction in the Middlesex Fells. The average Sunday attendance varies between five and ten thousand people. The animals, birds and reptiles are as follows:

Animals:

4 Black Bears, 6 Mountain Lions, 1 African Lion, 4 Jaguars, 5 Bay Lynx, 2 Canada Lynx, 1 Ocelot, 2 Timber Wolves, Coyotes, 8 Red Foxes, 1 Gray Fox, 1 Otter, 2 Mink, 1 Badger, 1 Mongoose, 1 Coatii, 2 Kinkajou, 8 Sheep, 6 Goats, 5 Peccaries, 2 Thar, 2 Llamas, 2 Texas long horn Steers, 6 Raccoons, 12 Gray Squirrels, 2 Fox Squirrels, 3 Porcupines, 4 Woodchucks, 1 Civet Cat, 5 Rhesus Monkeys, 2 Java Monkeys, 1 Vervet Monkey, 1 Grivet Monkey, 1 Megabey Monkey, 3 lesser Green Monkeys, 2 Ponies, 2 White Fallow Deer, 5 Virginia Deer, 1 Buffalo, 2 Elk, 30 Guinea Pigs, 12 Rabbits.

Birds:

10 Egyptian Geese, 2 Snow Geese, 3 Blue Geese, 6 Canada Geese, 1 White front Goose, 1 China Goose, 2 Emden Geese, 2 Toulouse Geese, 12 Black Ducks, 2 Rosy billed Ducks, 4 Mandarin Ducks, 30 Wood Ducks, 2 Pintail Ducks, 1 Gadwall Duck, 2 Red Head Ducks, 6 Call Ducks, 4 Crested White Ducks, 20 Mallard Ducks, 10 Pekin Ducks, 2 Runner Ducks, 2 Rouen Ducks, 16 Muscovy Ducks, 10 Blue Peafowl, 8 White Peafowl, 5 Black Shoulder Peafowl, 3 Lavender Guinea Fowl, 6 Purple Guinea Fowl, 6 Mongolian Pheasants, 4 Golden Pheasants, 4 Swinehoe Pheasants, 3 Teeves Pheasants, 3 Nepal Pheasants, 6 White Pheasants, 2 Manchurian Pheasants, 6 Formosan Pheasants, 10 Silver Pheasants, 2 Mutant Pheasants, 2 Versi colored Pheasants, 6 Amherst Pheasants, 2 Ring Neck Pheasants, 4 Black throat Pheasants, 8 Bob White Quail, 6 Valley Quail, 80 Pigeons, 2 Demoiselle Cranes, 2 Blue Macaws, 2 Red Macaws, 1 Sulphur Cockatoo, 7 Parrots, 1 Red Tailed Hawk, 1 Golden Eagle, 1 Bald Eagle.

Reptiles:

2 Timber Rattle Snakes, 2 Diamond Backed Rattle Snakes, 16 Alligators.

In the year just past a number of Waterfowl, Pheasants and Peafowl have been

hatched and raised at the zoo. In animals we had the following born and raised: 2 Jaguar cubs, 4 Mountain Lions, 3 Bay Lynx, 1 Deer, 2 Sheep, 4 Goats.

We received the following donations: 1 Ocelot, 1 Otter, 2 Mink, 1 Red Tailed Hawk, 4 Monkeys, 2 Parrots, 1 Sheep, 1 Deer, 1 Raccoon.

The following animals died: 1 Bull Buffalo, 1 Bay Lynx, 1 Golden Crowned Crane. It was necessary to slaughter 2 sheep and 4 goats.

A new squirrel cage with a concrete floor was built and also a concrete tank for the otter. A new drain was laid from the monkey house and new concrete steps and a walk built at the entrance. A permanent path was built at the back of the outdoor bird cages and surfaced with stone and asphalt. The drain from the duck pond was cleaned and a catch basin built. Another catch basin was made in back of the stable to drain the deer yard. A few other new cages were built and the rest kept in repair and painted.

A study has been made by Arthur A. Shurcliff, Landscape Consultant, for a new location of the zoo, with larger and improved cages. It is hoped an appropriation will be allowed at an early date so that this work can be started.

Charles River Lower Basin

Necessary repair work, such as mowing of the grass, cultivating tree pits and shrub beds and planted areas was carried on. Dead shrubs were replaced and 1,000 trees were fertilized. Over 1,000 yards of loam was spread where needed, grass plots were seeded and graded in the vicinity of the Technology Boat House on Memorial Drive. The ball grounds and park at Magazine Beach and Cottage Farm Bridge were rolled and seeded and new shrub beds planted. 1,375 new shrubs and 40 trees were planted in this area. Gravel sidewalks were weeded and raked daily and granolithic sidewalks were kept in constant repair. The river bank was rip-rapped and repaired in several places, and driftwood on the river was removed daily. About 50 tons of rip-rap was put in place between the Boston & Albany Railroad Bridge and the old Technology Boat House.

All life-saving apparatus was overhauled, repaired and painted, and life boats repaired, painted and put in serviceable condition.

The skating rink in the Lagoon was kept in excellent condition for skaters, due to the use of the ice scraper and shaver.

The tennis courts at Magazine Street were extensively used, and the children's playground kept in good condition.

Over 500 yards of free fill was spread at the location of Gerry's Landing.

Supervision of the various outboard motor boat regattas and boat races was handled by the superintendent of the division, who is also the Harbor Master of the Lower Charles River Basin.

General maintenance of the parkways, such as repairing joints with tar and oakum on the John W. Weeks Bridge, to prevent leaking, patching roadways, resetting of curb stones, clearing of snow, etc., was carried on.

Anchorage buoys on the basin were repaired and painted, and put out during the boating season.

A memorial to the late James J. Storrow, erected by Mrs. Storrow, was dedicated on September 10, 1936.

Six permits were granted to operate pleasure boats for hire on the Charles River Basin. These permits furnished delightful water trips which were enjoyed by a large number of people.

Bunker Hill Monument

The Bunker Hill Monument and grounds were kept in good condition. A new oil burning heater was installed. 27,070 persons ascended Bunker Hill Monument between November 1, 1935 and October 31, 1936.

Charles River Upper Division

The roadways and walks in the entire division were kept in good repair. Gutters and catch basins were cleaned and kept open. Embankments along the river were graded, loamed, seeded and planted with shrubs.

All buildings were repaired and fences and signs painted.

Large quantities of fill were received without charge from the Boston Elevated

Company, and other sources, which were used to fill the area east of the Speedway Track in front of the Harvard Property.

The playgound equipment at the Speedway Playground was repaired and painted, and a flight of eight concrete steps was installed at the entrance.

Drinking fountains and shower baths were installed at the Speedway and Faneuil Bath Houses.

A new retaining wall, approximately 100 feet long, was built along the bank of the river in the rear of the Riverside Headquarters.

Approximately 1500 feet of curbing was laid in front of the Riverside Headquarters, in cooperation with the City of Newton. About 500 feet of curbing was laid around the island in the rear of the Boston Elevated property at Nonantum Road and Water Street.

A row of young poplar trees was set out along Nonantum Road which will in time obscure the view of the Boston Elevated property.

Low places along the shore line on the river have been filled in, graded and smoothed. Trees were pruned and were sprayed with arsenate of lead, and dead and worthless trees removed.

A section of Soldiers Field Road from Telford Street to the Circle was given a surface treatment of oil and pea stone.

The Speedway track was kept in good condition. Well attended matinees and horse shows were handled by the Metropolitan Driving Club during the fall, winter and spring.

The baseball diamond at Riverside Recreation Grounds was loamed, levelled and rolled, and the running track was covered with cinders and rolled.

The swimming pool was pumped and cleaned out as needed during the bathing season, and a new diving board erected.

Picnic parties continued to gather at the Riverside Recreation Grounds during the summer.

The shores of the ponds in the Beaver Brook Reservation, Waverley Oaks, were loamed, graded and seeded. Considerable care was given the ancient oaks which were also pruned and preserved.

Ledge and rock formations along the Hammond Pond Parkway, which were unsightly and obscured the vision of motorists, were removed. The reservations adjoining the parkway have been loamed, seeded and set out with trees and shrubs.

All rustic fences were treated with linseed oil.

An irrigation system is being installed at the Riverside Recreation Golf Course.

Blue Hills Division

The general construction and care of the roads, buildings, grounds, sidewalks, catch basins, trees, shrubs, plants, etc. throughout the entire division has been taken care of.

The division received from Amherst College 10,000 four-year old hemlock, spruce and white pine seedlings which were set out in the nursery opposite police headquarters. About 10,000 white pine and spruce were taken from the nursery and set out in the vicinity of Sawcut Notch and Wampatuck Roads. Over 5,000 five-year old spruce and hemlock were set out in the James Estate between the sand pit and spring near High Street, Randolph.

About 60,000 square feet of banks on Unquity Road were graded, loamed and seeded.

A small dam was constructed in Pine Tree Brook at the junction of Unquity Road and Harland Street, known as the Glover Mill Site.

Considerable work was done by relocating buildings at the repair yard.

A 28 x 16 foot galvanized building was moved from the James Estate in Randolph and established in the rear near the garage at headquarters. This building is to be used as a blacksmith shop and replaces a small wooden building which has outlived its usefulness. An old building formerly used as a band stand at the Blue Hill entrance, was moved and erected near the children's playground on the east side of Hoosicwhisick Pond, to be used as a shelter for the protection of the public from storms.

About 500 yards of gravel was applied to Ponkapoag Trail between Blue Hill River Road and Hillside Street, in the vicinity of the parking space at Hoosic-

whisick Pond. Also, about 350 yards of sand was placed in the vicinity of the bath house at Hoosicwhisick Pond.

About 40 acres of badly infested land in the vicinity of Blue Hill River Road and Ponkapoag, was sprayed.

350 shrubs, including red pine, white pine, juniper, bayberries, blueberries, grape vines and mountain cranberry were set out on Unquity Road banks near Harland Street.

About 240 shrubs, comprised of spirea, forsythia, azalea, juniper, barberry, woodbine and globe arborvitae, replaced shrubs at Hoosicwhisick Pond and police headquarters.

About 50 red pine and 40 red cedars were set out around the service yard on Unquity Road, as a screen to shut out the unsightly view. Also set out as a screen or shield for the garage yard, 125 trees including golden willow, Lombardy poplar, hemlock, red cedar and white pine. 24 rhododendron and arborvitae were set out around the police station and the superintendent's house.

The roadways in the vicinity of St. Moritz Pond were improved, and a five-foot cement pipe leading from the upper pond to the lower pond was installed and a wall built on each side of the pipe.

About 5,400 cubic yards of gravel and fill was applied in making improvements in this location.

The concession stand at St. Moritz was washed, cleaned and repainted.

A seal-coat was applied on Blue Hill River Road from south of Hoosicwhisick Pond to Randolph Avenue.

Four stone culverts were constructed at various locations on the trails on Unquity Road.

The division forces constructed three miles of bridle paths in the Blue Hills Reservations.

Considerable time was given to the suppression of tree and plant diseases, white pine blister, rust and white pine weevil in about 3,500 acres.

The parking space and picnic area at Pakomet Spring on Randolph Avenue in the Quincy section, was completed.

At Spring Street, Dedham, in addition to the usual care of grounds, trees, etc., 50 shrubs were replaced, 125 new shrubs, mostly azaleas and forsythia, were planted.

10 maples and 4 oak trees were replaced.

In the Stony Brook Reservation, about 350 acres of infested area was sprayed with arsenate of lead for gypsy moth eradication.

About 35 acres of land in the section between Turtle Pond Parkway and East Boundary Road was cleared of dead wood.

Improved and enlarged the drainage system between the East Boundary Road, Bold Knob Road and Gordon Avenue, and also enlarged the drainage system from the sub-station at Brainard Street through Dedham Street to Turtle Pond Parkway, thus caring for the water and confining same in one well-defined culvert.

Installed a 350-foot water main from a dead end main on Dedham Street to house owned by the Commission at 57 Dedham Street.

A drinking fountain in the ball field near River Street, off Turtle Pond Parkway, was installed.

A drinking fountain was also installed in the Neponset River Reservation in the vicinity of Vose's Grove, Dorchester.

About 800 feet of open drain was constructed in the vicinity of Paul's Bridge, Readville, for the purpose of mosquito control.

Also about 350 lineal feet of similar work near Dorchester Lower Mills, between Adams Street and Granite Avenue in the East Milton section.

Set out 69 trees, comprised of English elm, white willow, laurel leaf willow, common elder and a few catalpa, in the section between Mattapan Bridge and Oak Street in a westerly direction, with the expectation that they will shut out an unsightly section on the Boston side of the river.

Applied 2,500 cubic yards of fill, loamed and seeded on unsightly section at the junction of Brush Hill Road and Neponset Valley Parkway on the west side of said junction. Graded about 12,000 square yards of banks on the west side of Granite Avenue, Milton.

Erected a 500-foot fence, wooden rails, along Granite Avenue on the west side, to prevent trespassers from Granite Avenue to Commonwealth property.

A seal-coat on the road from Hancock Street at Neponset Bridge to Squantum Street, Quincy in the Quincy Shore Reservation, was applied.

20 dead or diseased poplar trees were replaced with 20 white maple trees in this area.

A drinking fountain was installed near Atlantic Street on the beach front.

250 Japanese barberries were set out at the police sub-station near Davis Street and the parking space.

In the vicinity of Tirrell Street, damage done by severe winter storms was improved by depositing about 580 cubic yards of sand from our own sand pit on Hillside Street, Milton.

At the junction of Blue Hills Parkway, near Canton Avenue, a wooden building or field house 48 by 26 feet was constructed for use of the public during the skating season.

Also installed a water main to said building from Canton Avenue for a distance of 80 feet.

A seal-coat was applied on the east side of the parkway from Brook Road to Canton Avenue and about 900 square yards of bituminous matter to make a hard sidewalk at the waiting station for buses near Mattapan Bridge, was applied.

About 10 acres of tree land was sprayed for the purpose of eliminating insect pests in the vicinity of Dedham Parkway, and 5 acres of land adjacent to the Stony Brook Reservation was cleaned of dead wood.

A bituminous sidewalk along the Furnace Brook Parkway from Adams Street to Copeland Street, 6 feet wide and 5,500 feet long, was constructed.

25 weeping willow trees were planted on the west side of the parkway, north of Adams Street in West Quincy, and 28 hemlock trees were set out as a screen, in back of the Dorothy Quincy House, adjacent to the Armory off Hancock Street.

A stone wall was constructed on each side of Furnace Brook between the railroad bridge and Willard Street.

About 250 shrubs of various kinds were set out in the vicinity of Paul's Bridge, and fifteen diseased or dead trees were replaced with American and English elms on the Neponset Valley Parkway.

At the Old Colony Parkway, the division forces filled and graded unsightly sections on the southeast corner of Victory Road and the parkway.

About 840 cubic yards of fill was secured from the City of Boston, where certain streets were under repair.

About 500 cubic yards of sand was applied at the section on the west side of the parkway between Savin Hill Yacht Club and Dorchester Bay Bridge.

Culverts on the Turtle Pond Parkway leading from Turtle Pond to Smith Pond, Hyde Park, were cleaned and enlarged. This was necessary on account of drainage during the heavy rains and high water of the spring of 1936.

Constructed a cesspool at the so-called Galvin House adjacent to the Turtle Pond Parkway.

Constructed a new concession stand on the water side of the bath house at Havey Beach, Veterans of Foreign Wars Parkway, in place of a small insufficient one located within the building. A drinking fountain was installed in the north end of the bath house.

About 330 shrubs were set out in the vicinity of the bath house and the police sub-station. Also about 50 red oaks were replaced in various parts of the Veterans of Foreign Wars Parkway.

Replaced over 1,100 cubic yards of sand at Havey Beach, necessary on account of the high water during the spring of 1936.

A seal-coat was applied to the West Roxbury Parkway the entire length and width of the parkway from Washington Street, Roslindale to Hammond Pond Parkway.

A stone drain was constructed with two catch basins on the west side of Centre Street, between the Catholic Church and the parkway, which eliminated a continuous flow of water over the sidewalk on the west side of Centre Street.

About 155 feet of edgestone was set on East and West Border Road at various sections. A bituminous sidewalk was constructed on the west side of West Border Road and the east side of East Border Road, and 450 cubic yards of loam was applied to the grass plots on the sidewalks.

Nantasket Beach Division

The Nantasket Hotel and Cafe was kept in good repair. A barber shop was built in the basement, a new flight of stairs built from the hotel piazza to the street; roofs were repaired, conductors replaced, a new roof built on the bake shop, repaired the piazza railings and considerable painting inside and outside of the building.

This hotel was let as a concession during the season of 1936 for the sum of $10,000.

Considerable work was done on the police dormitory, a new piazza was installed, clapboards were replaced, gutter control pipes on the dormitory roof were repaired and a new floor laid in the dining room.

Considerable work was done repairing the waiting room building, and the inside was painted. Repairs were also made to the Tivoli Shelter stand, which was also painted.

About 870 lineal feet of sea wall was built with the division forces, and about 7,100 cubic yards of filling was deposited in back of the sea wall. This improvement increased the parking area more than 4,500 square yards. Both parking yards were oiled and sanded. The lawns and shrubs around the various buildings were cared for.

The beach was kept in excellent condition for the enjoyment of the thousands of visitors and vacationists.

Bath Houses

The following shows attendance and receipts at the bath houses operated by the commission where fees are charged:

	Number of Bathers	*Receipts*
Nantasket Beach	82,770	$18,164.55
Revere Beach	54,835	12,006.05
Nahant Beach	15,300	3,535.25
Magazine Beach	7,529	606.50
Hoosicwhisick Pond	2,872	287.20
Havey Beach, Veterans of Foreign Wars Parkway	1,370	137.00

Other bath houses are maintained at the following locations on a free basis:

Mystic River at Foster's Court, Medford
Upper Mystic Lake, Sandy Beach, Winchester
Charles River Reservation, Brighton
Charles River Reservation, Faneuil

Golf Courses

The commission's eighteen-hole golf courses (Riverside in Weston, and Ponkapoag in Canton) operated during the season from early April to November 30. The gross revenue at Ponkapoag totaled $22,797.20 for the season. The income from the Riverside Course ran to $14,135.70. 300 seasonal memberships at $20.00 for the season were sold at Riverside and 351 at Ponkapoag. A total of 38,700 rounds of golf were played at Ponkapoag and 24,500 at Riverside.

A W.P.A. project was sponsored by the commission to provide preliminary development for the construction of nine additional holes at Ponkapoag. 30 acres of standing timber and brush were cleared and all stumps removed. Drainage ditches about 5 feet wide and 4 feet deep were dug to a length of one and one-quarter miles, and 1,600 feet of 10 in., 12 in. and 15 in. vitrified pipe drains were laid. The clearing of the area provided more than 500 cedar posts which can be used to good advantage in other sections of the Blue Hills Reservation, and 150 cords of fire wood were also secured. All of the buildings at Ponkapoag were repainted and necessary maintenance repairs were made. 550 feet of 1¼ in. water pipe was installed at the club house and sod nursery.

Four tees were completely rebuilt and all eighteen were resodded. The sod nursery was replenished with velvet bent stolons secured from the Kernwood Country Club in Salem. 450 small evergreens were set out in the vicinity of the No. 4 fairway so that an unsightly area could be screened. The grounds near the pump house and other buildings on the course were graded and reconditioned.

The installation of a fairway irrigation system for nine holes at Riverside was begun in the late fall. The labor for excavation and other purposes is provided by a W.P.A. project. The system will take water from the Charles River near the Concord Street bridge, and will not only materially reduce the cost of water now being taken from the City of Newton supply, but should provide a substantial improvement in the quality of the turf on the course, as the river water is rich in organic matter. A capacity of 500 gallons per minute will be obtained from the two centrifugal pumps powered by two 25-horse power motors in the installation. A total of 7,825 feet of cast-iron water pipe, principally 4 in. in size, will be laid in the fairways and 2,500 feet of No. 2 wrought-iron pipe now in use for watering greens and tees will be relocated and incorporated into the new system. Other construction involved will include a small cement block building to house the pumping equipment, a reinforced concrete sump 18 feet deep, 12 feet long and 12 feet wide, a canal, and settling pool 100 feet long, 60 feet wide and 18 feet deep. The settling pool will be located on the No. 8 fairway and will provide the course with its only water hazard. Considerable other work in addition to the usual maintenance was accomplished during the year. All buildings and fences were painted and repaired. Lawns adjacent to the club house were loamed and seeded and additional plants and shrubbery were set out. A new practice putting green was completed and opened for use. A triple tee was constructed for the first hole, which will provide an opportunity to keep the starting tees in good condition by rotating play among them. All other tees on the course were reconditioned and duplicate tees for spring play have been provided on several holes. A considerable amount of gravel fill from the Norumbega Road construction project was used in widening the fairway of No. 3 hole, and the fairway was loamed and seeded for 1937 play. Two drinking fountains have been installed at new locations, and a large number of trees of various species have been set out as backgrounds for greens and fairway divisions. The No. 16 hole has been shortened from 200 to 155 yards to provide an iron shot hole.

Band Concerts

The annual appropriation of $20,000 for band concerts in various sections of the parks district provided a total of one hundred and twenty-one concerts at a cost of $19,947.65. The schedule was divided among sixty-two of the one hundred bands submitting bids.

The music shell on the Boston Embankment was not dissembled for the winter season as a barricade to protect its interior was erected in front of it. This not only resulted in a substantial saving in the cost of removal and reassembling, but will eliminate considerable wear on the structure.

The symphony concerts conducted by Arthur Fiedler and his fifty players from the Boston Symphony Orchestra, were carried on for the eighth successive season during the four weeks between July 12 and August 7th. A series of twenty-four concerts were enjoyed by the usual large and attentive audiences. The total attendance was estimated at 240,000 for the series. The commission's share of the receipts from the chair renting concession amounted to $1,629.93. This money, which was deposited with the state treasurer, helps to defray the expenses of the commission in putting on the concerts.

Civilian Conservation Corps

The C.C.C. camps located in the Blue Hills and Breakheart Reservations continued in operation during the year.

The Blue Hills camp began construction during the late summer of a stone observation tower, generally similar to the one erected in the Chickatawbut Overlook development, on the summit of Great Blue Hill. The tower is the first approved unit in a development which eventually will include a 70 feet shelter with a massive fireplace, a wide terrace fronting the shelter, outdoor tables and settees, two sanitaries and a layout of paths with other necessary landscaping.

The two downhill ski-runs on the westerly side of Great Blue Hill, which were rendered usable last winter, were given further attention in the spring to put them in excellent shape. A six-acre ski practice area, accessibly located off Chickatawbut Road, was also completed during the year. The practice area was designed and constructed to provide slopes of varying gradients to enable the novice skier to

bring himself along to a point where the more difficult downhill runs could be attempted. Considerable progress has been made on the construction of a cross-country ski trail which will traverse the entire length of the reservation from the West Quincy skating ponds to Great Blue Hill. The stretch from West Quincy to the ski practice area is now in sufficiently good shape for use this winter.

A program of improvements in the 600 acre tract easterly from Ponkapoag Pond, acquired from the James Estate late in 1935, was carried out. The police signal service system was extended into the tract to a distance of 1.3 miles and 2.6 miles of truck trails were constructed to give access to the property for maintenance and fire protection purposes. A thorough scouting for evidence of ribes, the host plant of the white pine blister rust, was carried on during the summer in the new area and the rest of the reservation.

An intensive campaign was inaugurated during the fall, to run through the entire winter, to combat the growingly serious problem of gypsy moth infestation. A large crew of enrollees have been assigned to the work and it is expected that several million egg clusters will have been creosoted by early spring. A corrective treatment for white pine weevil, another menacing pest, was given to more than 15,000 white pines in the early summer.

The Pakomet Spring parking area was completed early in the season. This development, located on the easterly side of Randolph Avenue, provides an attractive spot for picnic parties. The work involved consisted of the construction of natural stone entrance walls, suitable guard rails, grading and landscaping, and the installation of tables and seats. The spring was thoroughly cleaned out and rebuilt.

Other work accomplished during the year by camp work details included the rebuilding of two miles of police signal system, 3.4 miles of service roads, 3 miles of horse trails, six stone culverts at trail intersections, and sixteen rustic settees. 493 man-days were expended on forest fire fighting and 100 man-days in searching for missing persons. A total of 35,850 man-days of labor were expended during the year on the seventeen approved work projects in the camp program.

The Breakheart Reservation camp continued work on the park road started in the early fall of 1935 and completed it to sub-grade during the year. The construction of this road, which is 2.3 miles in length, presented considerable difficulty as more than 1,200 yards of ledge had to be removed and an unusually large amount of drainage provided. An additional strip of land has been acquired between Lynn Fells Parkway and the reservation entrance which will permit a double driveway entrance road to the starting point of the one-way park road.

A layout of the entrance driveway is now being prepared by the Commission's landscape consultant. A survey of both Breakheart and Middlesex Fells Reservation was made by ski experts to determine the suitability of the terrain for skiing facilities. It was not found possible to lay out any downhill runs but a suitable practice area with a drop in elevation of about 100 feet was constructed in Breakheart. This practice slope is now ready for use. No cross-country ski trails in Middlesex Fells were suggested by the experts as the reservation is amply provided with trails and service roads which are generally adequate for the purpose.

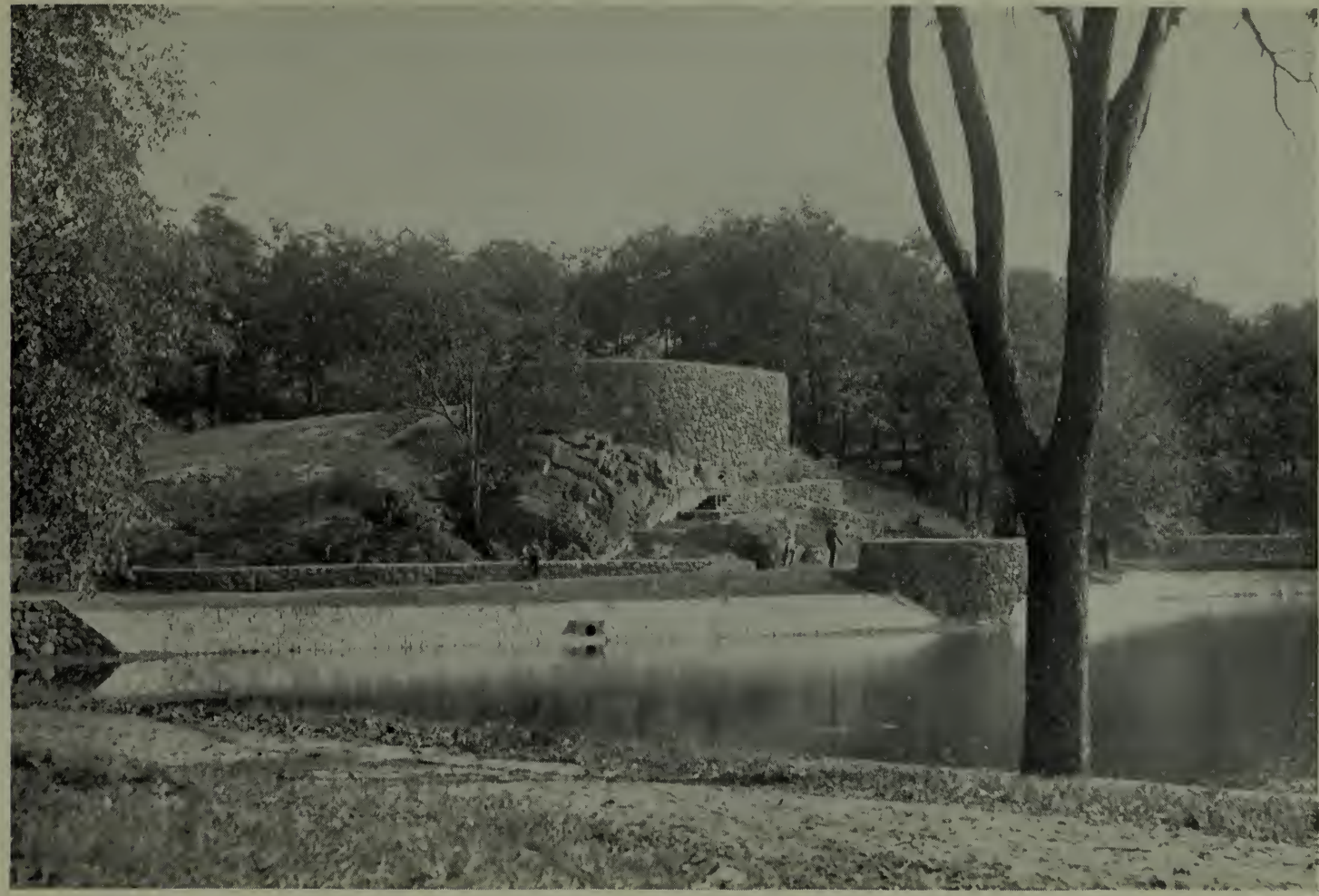
Other work included the construction of two miles of truck trails, clearing of a swampy area at the lower pond and a thorough scouting of both reservations by gypsy moth crews. Fire fighting details assisted in extinguishing fires on adjacent property on several occasions to prevent damage to the reservation.

All work details in the camp were assigned to flood clean-up work in the City of Lawrence for three weeks in March and April. A detail of 40 men were sent to Salisbury Beach during the last week in May to clear sand from the beach road. Fifty man-days of labor were expended later in the season in the City of Lynn to assist in the removal of fallen trees after a severe wind storm. A total of 30,82 man-days were worked by the enrollees during the year.

Works Progress Administration

The commission was able to continue the operation of a varied program of improvements and development under W.P.A. auspices on which materials, equipment and general supervision could be contributed to the projects. Several projects started during 1935 under E.R.A. were transferred to W.P.A. and completed durin

Bridle Path, Whip Hill Section of Middlesex Fells, Constructed by W. P. A.



Overlook, Fellsmere Pond, Malden, Constructed by W. P. A.

1936. A total of twenty-four projects in the Parks Division and two in the Water Division were sponsored during the year, the bulk of which were completed before severe weather set in. A maximum of 1,600 workers were employed in the entire program, although it is becoming increasingly difficult to devise projects where it is possible to employ large groups of men.

The 1936 appropriations for Parks Division purposes included $50,000 for the commission's share of the project expenses. This amount enabled the commission to obtain a total of $647,492.10 of Federal expenditures for the work carried on during the year. The $50,000 appropriation for the commission's contributions was extended to an actual value of $160,032.85 through the use of commission-owned equipment, services of its regular personnel and other participation for which no expenditures were necessary.

The two projects in the Water Division expended a total of $97,150.88 of Federal Funds during 1936. The commission's contributions to these jobs were provided for the most part during their operation under E.R.A. in 1935, from special construction appropriations.

Twenty-five additional project proposals have been prepared and are ready for submission to the W.P.A. in 1937 if the commission is able to obtain another appropriation of $50,000 for its share of the expense.

W. P. A. Traffic Survey

During the year 1936 a Traffic Survey Project sponsored by the Commission under the direction of the Works Progress Administration, was completed in every division of the Commission.

Vehicle Volume Counts at approximately two hundred intersections were taken during the hours of 1 P.M to 7 P.M. Every vehicle movement was checked during this period. Half hourly summary sheets together with a complete intersection summary diagram gives a complete vehicle movement picture at each of these intersections.

The vehicle accidents of all the divisions have been analyzed and summarized with respect to minor and major type, and a general breakdown of all accident circumstances have been recorded on a monthly and yearly summary form.

Large scale drawings have been made of every parkway in the Commission, especially for traffic activities including spotting accident locations, vehicle volume flow and radio field sounding.

An accident location file system has been devised for every division, each division being sub-divided into the various parkways, and a tab card set up for every roadway that enters or crosses our parkways.

A detailed report covering all types of traffic control, road surfaces, signs and types of intersections was made for future reference.

Police Radio Survey

The Metropolitan District Commission sponsored the W.P.A. Radio Survey Project on March 2, 1936. Since that date the project has been engaged in planning and creating an efficient two-way police radio communication system for the Metropolitan District Commission. Due to the fact that the Metropolitan District Commission has a program of research and experimentation which indicates a reasonable promise of substantial contributions to the development of the radio art, it is felt that the system being developed will greatly increase the effectiveness of the Commission's services which have for thirty odd years been rendered to the forty-three communities of nearly two million persons. Protection of the health and safety of the inhabitants of the forty odd municipalities which comprise the Boston Metropolitan area will be increased through the development and maintenance of this most modern communication network.

The experimentation and research work handled by qualified experts of the Radio Survey is creating and developing a most modern communication system for the territory under the jurisdiction of the Commission.

As a result of the work covered by this project, the Commission has expended to date approximately $11,998.64 for material and equipment for its Police Communication System. Actual experimental and research work in Headquarters and field, and the compilation of data resulting from these studies is now being conducted.

The final Metropolitan District communication system will employ a combination of two-way radio-telephone and land line communication and the radio section will be sufficiently flexible to employ facsimile (visible recording of messages) as well as oral (loud speaker) reception. The necessary engineering data is being compiled, and transmitting licenses have been obtained from the Federal Communications Commission to cover the operation of the ten transmitters at present in use by the Commission.

It is planned within a short time to employ facsimile on ultra high frequencies. This in turn will be supplemented at still higher frequencies by television. The use of these extremely high frequencies will minimize interference with existing services and will insure greater secrecy than has been possible heretofore. It will also increase the efficiency of transmission. Both facsimile and television are accomplished facts at the present time, but the difficulties to be overcome are principally mechanical, and pertain to the reception of television and facsimile signals in mobile units, such as police cars, airplanes, and police boats.

The complete Metropolitan District Commission communication system will employ approximately forty cars, several airplanes, police boats and portable radio-telephone units capable of two-way communication. These portable units will be available for use in riots, fires, floods or other public emergencies. The Commission appreciates the development work which has been accomplished by this Radio Survey Project, made possible by the expenditure of Federal W.P.A. funds. It is felt that the continuance of the engineering development and compilation of data made possible by this means will render invaluable service to the Commission. The results produced by this project to date indicate its continuance to be a necessity in the development of the Metropolitan District Commission Communication System.

Purpose of the Radio Survey Project

The purpose of the Radio Survey Project is to develop a communication system sufficient to properly meet the needs of the Commission, its Parks, Health, Water Supply and Sewerage Disposal Districts and one which is competent to perform the following duties:

1. To provide ready communication between the public and the police.
2. To provide communication between patrolmen and mobile units and their senior officers, both in the stations and in the field.
3. To provide for instantaneous and dependable communication between the police and health units of the Metropolitan District Commission, and the police, fire and health departments of the forty odd cities and towns of the Metropolitan District Commission Area.
4. To provide communication between the Metropolitan District Commission General Headquarters and its mobile units, such as police cars, police boats, water districts, and fire trucks.
5. To provide a dependable direct communication system between the Metropolitan District Commission Headquarters and its outlying Water Supply Territory in time of emergency, and
6. To provide a state organized connection link with those states which have a similar system and which are developing their radio communications to such a point that a coast to coast network of police communications may be able to serve the public of these United States. This latter plan has the final approval and co-operation of the Federal Department of Justice.

Construction and Installation of Equipment

The installation of a new alternating current supply, antenna and other equipment now on hand has required several months of proposals, bids, rejections and requisitions, all of which have been negotiated by this Project under Metropolitan District Commission direction. The program of obtaining transmitter licenses from the Federal Communications Commission, technical and office routine and the studies necessary to determine the type and power of radio equipment and the frequencies best adapted to the Commission's demands have constituted its work.

A specially designed one hundred foot steel radio tower has been erected on the roof of the Commission building as a result of these studies.

Two automobiles of the Commission are equipped to date with ultra high frequency radio transmitting and receiving equipment, and at present are being used in the field survey work. When not actually engaged in field work these two radio equipped cars are available for routine police duty.

A high frequency antenna, high voltage power supply and high power transmitter has been designed and constructed at the Commission headquarters.

The design of communication equipment both at the Commission headquarters in Boston and at the new Administrative Buildings being constructed at Ware, is being handled by this Radio Survey Project.

The equipment now installed and in the process of installation not only provides the working tools for this Project, but will become a part of the permanent equipment of the Metropolitan District Commission Police Radio Communication System, thereby providing a minimum expenditure for equipment which is useful only for experimental purposes.

The new headquarters ultra high frequency antenna embodies revolutionary design in steel tower construction. This new vertical antenna structure is built on a telescoping principle so that its present height of fifty odd feet from the roof of the Commission headquarters may be increased or doubled as the Commission's radio division feels that need of more powerful transmitting facilities for communication with the Quabbin Reservoir Territory. This specially designed antenna is the only one of its type in this part of the country.

At present the top of the tower rises an additional forty-five feet from the structure itself. Fifteen feet higher than the top of Bunker Hill Monument, it looks down on Somerset Street from an altitude of 243 feet. The top of the antenna is 321 feet above sea level.

The telescoping feature permits the use of the most modern antenna designs. A "J" type antenna is employed with a special feeder cable arrangement. It may be so adjusted as to meet the transmitting and receiving needs of the radio division.

The Commission cars by the use of these directive antennas will be able to talk directly back to Headquarters from practically all points in the Boston Metropolitan area, as an emergency measure. To insure secrecy, such antennas will be used. The car's normal procedure will be to communicate only with its division station.

The main transmitter is a crystal controlled special high-powered unit, licensed by the Federal Communications Commission for a maximum power of 500 watts output.

The broadcasts have already been reliably received at points more than two thousand miles away, with an output of two hundred watts, less than half of the power of the completed installation.

In order to direct the power of this transmitter, the most modern type of directional antennas will be employed to create a minimum of interference with existing radio services operating on or near the Commission frequencies and to provide the Commission with a signal power at desired points roughly equivalent to the obtainable from a transmitter of five times the power of the present set.

It is expected that the Federal Communications Commission will issue regulations in the near future rendering the use of such directional antennas mandatory. This fact is evidenced by present broadcasting stations engineering procedure. This is illustrated by the fact that a new broadcasting station under construction in Boston will create a minimum of interference towards Worcester, but will produce a signal of approximately ten times the rated power of its transmitter over the desired areas.

Forty odd radio equipped cars and the six patrol boats of the Commission will be equipped with the usual loudspeakers for audible receptions, they will also be equipped for the reception and transmission of "facsimile" messages.

This alternative method of communication is a new development in radio and is somewhat similar to television, except that it makes use of a single radio frequency and is consequently a much simpler and practical method of signal transmission. Facsimile and radio teletypewriter services will be eventually employed in the Commission cars. This system will make it possible for messages to be understood only by the Commission receivers and is expected, except in cases of emergency, to be the system generally employed.

All construction and testing work on the Radio Project has been accomplished

by W.P.A. labor and through W.P.A. funds. All material and equipment installed has been purchased by the Commission.

V. Recommendations to Legislature

In accordance with the provisions of section 33 of chapter 30 of the General Laws, as appearing in the Tercentenary Edition thereof, the following recommendations were submitted and contained in House 35:

I. Reconstruction of the Revere Beach Parkway in Medford, Everett, Chelsea and Revere

Under the Boulevard Act (chapter two hundred and eighty-eight of the acts of eighteen hundred and ninety-four), lands were taken for a parkway from the Charles Eliot Circle at the southerly end of the Revere Beach Reservation in Revere to the Middlesex Fells Parkway in Medford, a distance of about five and one-quarter miles. Construction was started in eighteen hundred and ninety-nine and the entire work completed in nineteen hundred and five. This roadway was originally built about thirty feet wide on a clay base which was satisfactory for the proposed horse and buggy use, as the era of enormous automobile travel was not contemplated. Since that time, it has been necessary to reconstruct certain portions of this parkway, due to settlement caused by the heavy automobile travel.

At present, it is one of the heaviest travelled motor arteries north of Boston in need of reconstruction. Since the location of the horse racing track was established in Revere, adjoining the Revere Beach Parkway, and the location of the dog racing track within a very short distance of this parkway, this already overloaded roadway is choked with traffic whenever races are held. The narrow parkway, only thirty feet wide in places, is so congested on week-ends, holidays, and days when the population desire to reach the beaches or the North Shore, that hours are consumed to travel a distance that should take only a few minutes.

The Commission having in mind the burden of taxation carried by the municipalities comprising the metropolitan parks district for benefits enjoyed by others, is of the opinion that, as this artery is extensively used, not only by those living outside the parks district, but also for interstate traffic, being a portion of U. S. Route No. 1, this improvement should not be assessed on the parks district, but the entire cost should be taken from the Highway Fund with a contribution by the Federal Goverment if possible. This parkway or boulevard should be reconstructed so that it will have a minimum total roadway width of one hundred feet, divided with a reservation of planting area and such traffic circles, overpasses, or underpasses as are necessary to eliminate dangerous traffic and pedestrian intersections.

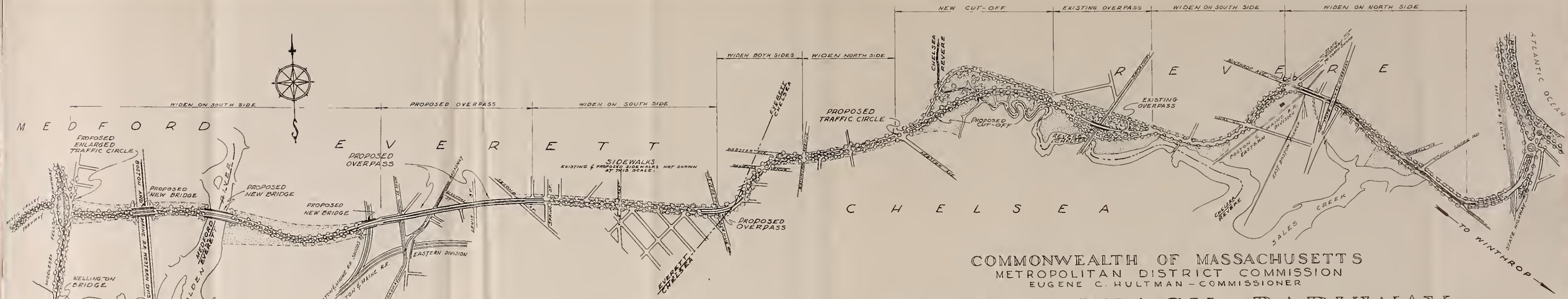
With a population of the district that has doubled since the parkway was first authorized and the tremendously increased automobile traffic that now uses this parkway, the Commission respectfully request favorable authorization of this essential legislation.

II. Reconstruction of the Old Colony Boulevard from Columbia Circle to the Southern Artery Traffic Circle, Boston

The need of a traffic highway for pleasure vehicles en route from Boston to the South Shore and the Cape, was felt twenty-five years ago when the legislature appropriated money for the Metropolitan Park Commission to purchase land along the shore front of Dorchester Bay in order to work out the problem. Portions of the areas had been used as dumping grounds, while others were mud flats.

Owing to limited appropriations that authorized the construction of this roadway it was impossible to construct a proper base for the present Old Colony Boulevard consequently, it is uneven due to settlement which necessitates constant repairs. This boulevard has become the main artery from Boston to the South Shore and the Cape. It is forty feet wide and about three miles long, and due to its narrow width, is choked with traffic its entire length, more especially during the in-coming traffic in the morning and the out-going traffic in the evening.

Recommendations similar to those made in the report on the Revere Beach Parkway are respectfully submitted for the Old Colony Boulevard, and the Commission is of the opinion that the cost of reconstructing this traffic artery should also be taken from the Highway Fund.



COMMONWEALTH OF MASSACHUSETTS
METROPOLITAN DISTRICT COMMISSION
EUGENE C. HULTMAN - COMMISSIONER

REVERE BEACH PARKWAY

PLAN FOR WIDENING AND IMPROVEMENT

SCALE OF FEET
600 0 200 1000 2000 3000

ARTHUR A. SHURCLIFF LANDSCAPE ARCHITECT
11 BEACON STREET, BOSTON, MASS.
FEBRUARY 16, 1937

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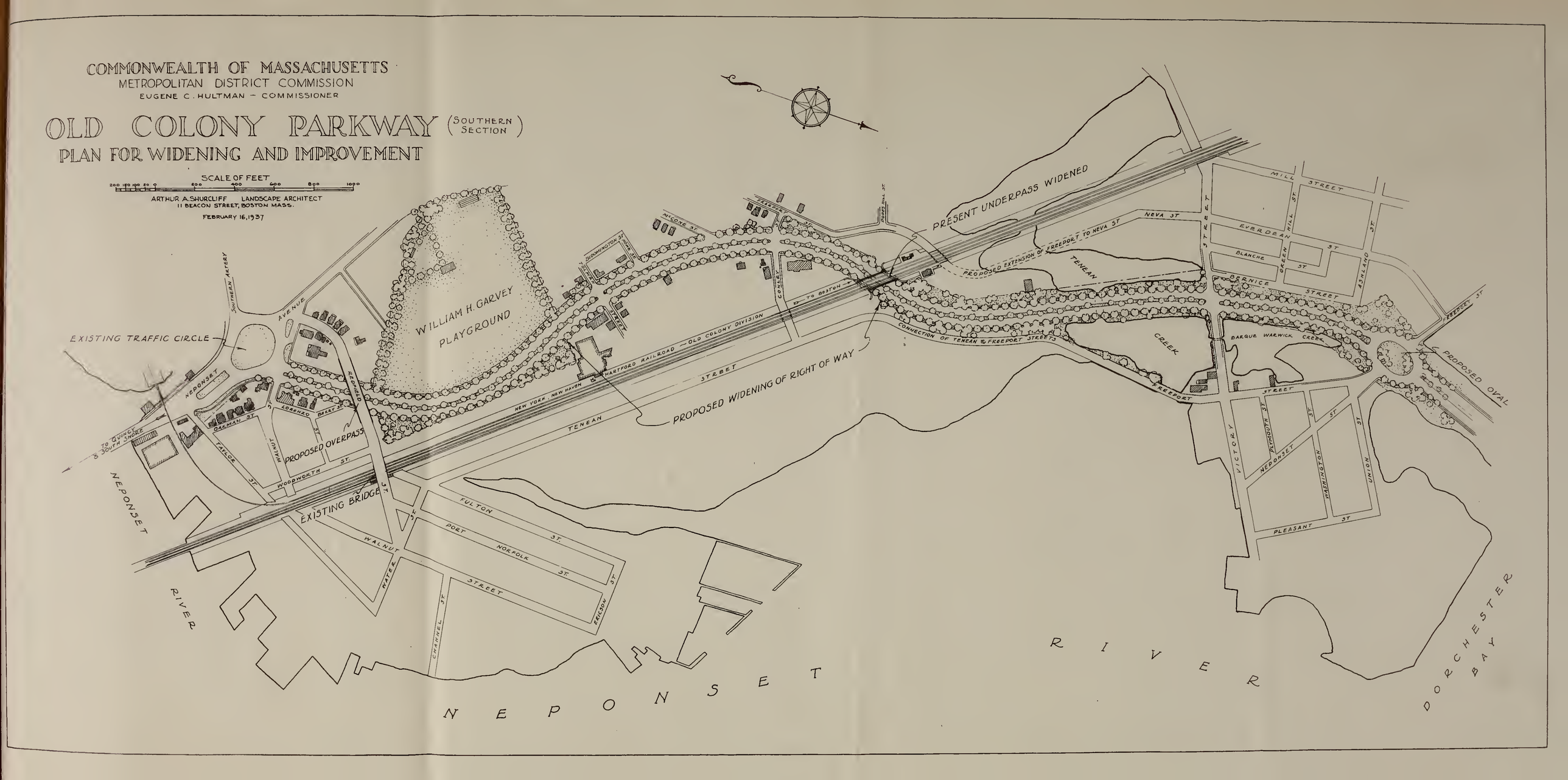
COMMONWEALTH OF MASSACHUSETTS
METROPOLITAN DISTRICT COMMISSION
EUGENE C. HULTMAN – COMMISSIONER

OLD COLONY PARKWAY (SOUTHERN SECTION)

PLAN FOR WIDENING AND IMPROVEMENT



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III. Continuation of the New Mystic Valley Sewer.

The Legislature of 1935 by Chapter 478 of the Acts of 1935 authorized the construction of the new Mystic Valley sewer in the North Metropolitan District. It was brought to the attention of the Legislature, through its Metropolitan Affairs Committee and Ways and Means Committee, that the construction called for in the Act referred to was merely a part of a comprehensive scheme calling for the eventual building of a new relief sewer throughout the entire length of the North Metropolitan District.

The work authorized by said Act, upon completion in the near future, will entirely relieve the Aberjona River, the Mystic Lakes, and in great part, the Mystic River above Cradock Dam from pollution by sewage.

The new construction work authorized, necessitates an overflow in the tidal waters of the Mystic River below Cradock Dam. This overflow, when the work is completed in the coming summer months, will be in operation and will add additional pollution to the Mystic River, which is already receiving a great amount of sewage overflow, thus aggravating existing conditions. The Commission, therefore, recommend as part of the comprehensive plan already referred to, that the 1937 Legislature authorize construction for the continuation of the work now under way from a point described in Chapter 352 of the Acts of 1936 in a general easterly direction to the approximate location of the present East Boston Pumping Station.

This construction would involve approximately 21,000 feet, more or less, of relief sewer varying from 8′-6″ in diameter to 13′-0″ in diameter, and would include additional pumping facilities, at or near, the site of the present East Boston Station.

The estimated cost of these works is $4,500,000.

Other Improvements and Recommendations

The work thus far accomplished in the Charles River Basin, under Chapter 371 of the Acts of 1930, is confined almost wholly to the Boston side and includes nearly three miles of shore reclamation extending from the Charles River Dam to the Longfellow Bridge, thus providing a recreative area of about forty acres embracing about four miles of new foot path, and over a thousand shade trees bordering extensive lawns. The work included the construction of the boat-haven with a breakwater opposite Embankment Road, and a monumental landing with planking landings. Incidental to this work an underpass was built on fills provided by the Commonwealth under the Longfellow Bridge. A lagoon was built opposite the end of Fairfield Street-Gloucester Street, measuring about 250 feet wide and one thousand feet long, and provided with a stone arch at each end, with appropriate shrub and tree planting together with granite steps following the southerly edge of the lagoon. Flanking the lagoon on each side, monumental boat landings were installed with floats and extensive overlooks provided with seats and shade trees. The concert oval was graded, loamed, and provided with paths, shade trees and shrub planting.

The work undertaken in the Basin has attained beauty and usefulness of a substantial kind. Visitors have increased greatly in numbers and the public enjoyment cannot be overestimated. The attendance at the concert oval has been so great that the oval may require enlargement. The sloping shores on the Boston side have reduced the menace of the topple waves along that shore to such an extent that the number of days during which water conditions have been made suitable for rowing have been nearly doubled, with a corresponding increase in the use of the Basin. The topple waves on the Cambridge side remain essentially unchanged, and of course the normal waves under high winds in the wide expanse of the Basin remain unchanged. The popularity of the Fairfield Street-Gloucester Street lagoon has been so great that further facilities of this kind are contemplated.

The link of river shore parkway from the Galen Street bridge in Watertown eastward to the termination of the previous parkway construction has been completed. The underpass at Massachusetts Avenue has been built, but further improvement of conditions on the Cambridge side of the river, including the extension of the Memorial Drive to and through Gerry's Landing to Fresh Pond Parkway, has not been carried out.

Since the purposes of the Act were carried out in the Basin as described above, the need for further improvements has become apparent and these include the following:

There is need for modern traffic separation at the northerly end of the Cottage Farm Bridge. The Commission recommends an overpass to preserve the continuity of the main line travel along the Cambridge side of the river and the construction of a circle beneath the underpass to facilitate bridge travel. This separation of the main line travel from the bridge travel will permit the use of a relatively small circle and this will not encroach upon the adjacent recreation grounds reserved for bathing, boating, field sports, and for the proposed lagoon and future boat house.

To accommodate bus boats and other craft of equal draught in the reaches of the river between the Watertown Dam and Soldiers' Field, this section of the river should be dredged to remove the accumulations of silt.

To meet the need for additional recreative facilities along the river above the Watertown Arsenal near the Boston-Watertown line, one or more lagoons as shown on the accompanying plan, should be constructed. These lagoons should be of the type of the lagoon already built at the Charles River Basin opposite Fairfield Street-Gloucester Street and would accommodate bathing, boating, skating and the sailing of model boats. This portion of the river is developing rapidly with small craft, but no farsighted improvements have been carried out as yet other than the construction of the marginal park roads.

The Commission has awarded a contract to build a masonry boat landing below the Galen Street Bridge at a point where bus boat passengers can make direct connection with the rapid transit facilities in and near Watertown Square.

On the Cambridge side of the river the continuity of nearly eight miles of existing river shore parkway extending from the Charles River Dam to Watertown Square is broken by an unfinished gap of about a mile, between the westerly termination of Memorial Drive at Ash Street and the easterly termination of the Arsenal Parkway at Arsenal Street. The Commission recommends legislation to complete this parkway and to provide the Fresh Pond connection described in the Act of 1930. A masonry foot-bridge of appropriate design is proposed to connect the Lowell Memorial Park through Gerry's Landing with the Longfellow meadows and Soldiers' Field. From the bridge the roofs and spires of the University and many of its buildings would be seen over the bend in the river and the river parkways. The suggestion is made that the bridge might be erected as a memorial to President Eliot.

The Commission recommends a relief road from the northerly end of Hereford Street westerly to Granby Street to abate the intolerable traffic conditions existing at Massachusetts Avenue and Harvard Bridge. This relief road will pass under the Harvard Bridge, thus separating grades but requiring no new bridge or underpass construction. The Commission is opposed to the construction of a road behind Beacon Street extending easterly from Hereford Street to Otter Street, believing that such a road would add to existing traffic complications.

The results of the work carried out on the Boston side of the Basin have fulfilled the hopes of those who supported the Acts of 1930; boating conditions in the Basin have been radically improved and that the public has availed itself of the recreative facilities on the water and on the shores. The Commission believes the time has arrived to undertake similar work on the Cambridge shore. The proposal is to extend a short headland into the Basin from the Cambridge end of the bridge corresponding to the headland on the Boston side, and to leave a waterway on the landward end of the promontory to form a portion of a long lagoon extending along the Cambridge Embankment. The outer barrier of this lagoon would be provided with sloping shores, as required by the Acts of 1930 and this should eliminate the topple wave which now makes boating hazardous near that shore. Within the lagoon quiet water would prevail during all directions of the wind, consequently ideal boating and skating conditions would be created. The width of waterway would be sufficient to accommodate large shells, also small craft including row boats and canoes. A sloping shore would also be provided against the present sea wall and the bare expanse of stone-work would be relieved by occasional trees, shrubbery and vines. From the high level of the promenade, sightseers could overlook the entire lagoon and the activities of the water sports. The outer barrier would flank the boat house recently built by the Institute of Technology, and would assist the development of an appropriate recognition of the frontage of the Institute upon the Basin.

METROPOLITAN DISTRICT COMMISSION

EUGENE C. HULTMAN, COMMISSIONER

PROPOSED CHARLES W. ELIOT MEMORIAL PEDESTRIAN BRIDGE.

AT GERRY'S LANDING, CHARLES RIVER RESERVATION

ARTHUR. A. SHURCLIFF LANDSCAPE ARCHITECT

MARCH - 1937

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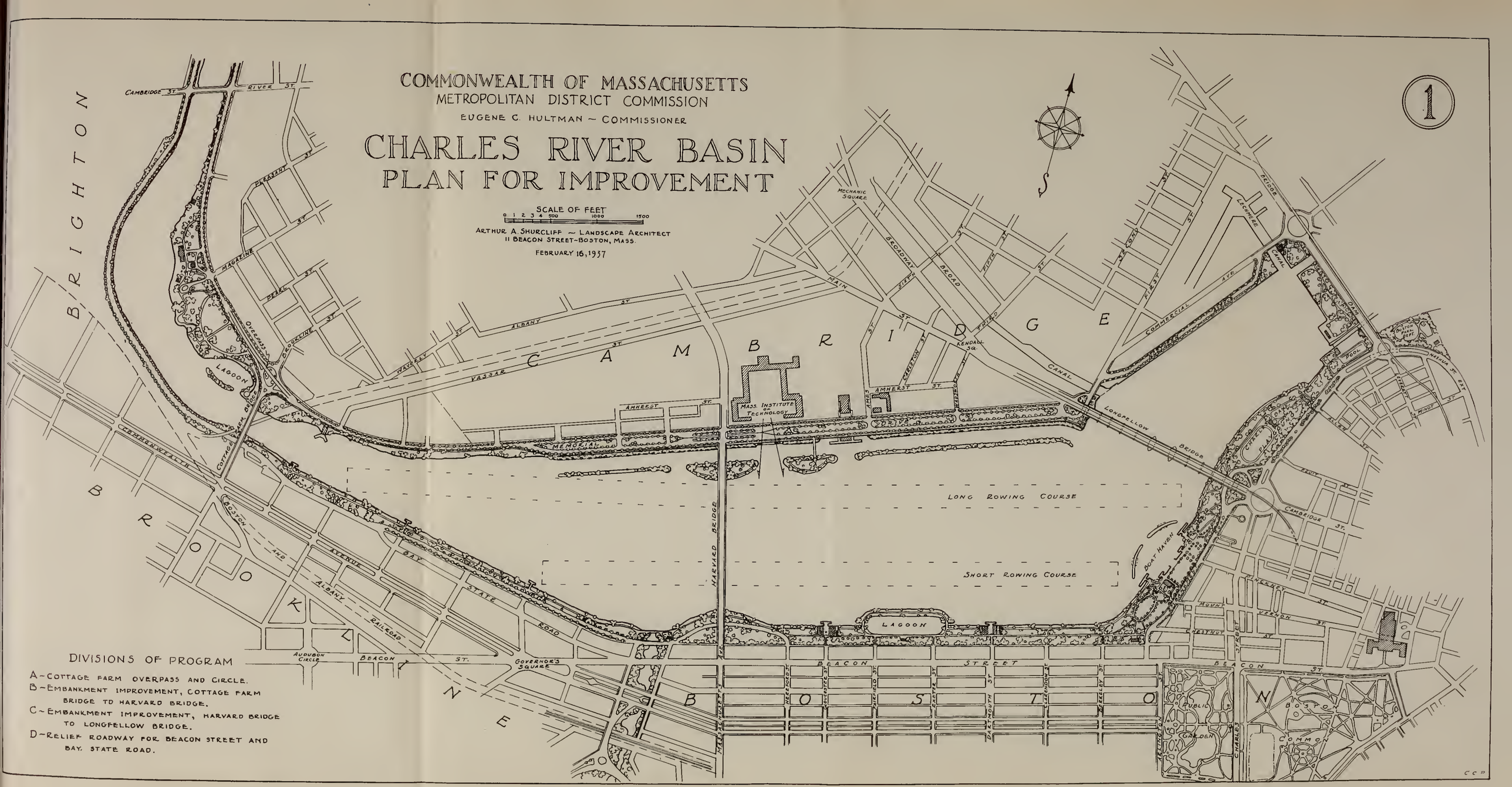
COMMONWEALTH OF MASSACHUSETTS
METROPOLITAN DISTRICT COMMISSION
EUGENE C. HULTMAN ~ COMMISSIONER
CHARLES RIVER BASIN
PLAN FOR IMPROVEMENT
SCALE OF FEET
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ARTHUR A. SHURCLIFF ~ LANDSCAPE ARCHITECT
11 BEACON STREET-BOSTON, MASS.
FEBRUARY 16, 1937
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DIVISIONS OF PROGRAM
A-COTTAGE FARM OVERPASS AND CIRCLE.
B-EMBANKMENT IMPROVEMENT, COTTAGE FARM BRIDGE TO HARVARD BRIDGE.
C-EMBANKMENT IMPROVEMENT, HARVARD BRIDGE TO LONGFELLOW BRIDGE.
D-RELIEF ROADWAY FOR BEACON STREET AND BAY STATE ROAD.
BRIGHTON
BROOKLINE
CAMBRIDGE
BOSTON
CAMBRIDGE ST.
RIVER ST.
PLEASANT ST.
MAGAZINE
PEARL ST.
OVERPASS
BROOKLINE
LAGOON
COMMONWEALTH AVE.
COTTAGE FARM CIRCLE
ALBANY ST.
HARVARD ST.
MAIN ST.
VASSAR
MEMORIAL DR.
AMHERST ST.
MASS. INSTITUTE OF TECHNOLOGY
HARVARD BRIDGE
MECHANIC SQUARE
BROADWAY
SIXTH
BROAD
FIFTH
THIRD
KENDALL SQ.
AMES
MERRIMAC
CANAL
LONGFELLOW BRIDGE
LONG ROWING COURSE
SHORT ROWING COURSE
BOAT HAVEN
BOSTON AND ALBANY RAILROAD
BAY STATE ROAD
AUDUBON CIRCLE
BEACON ST.
GOVERNOR'S SQUARE
MASS. AVE.
LAGOON
BEACON STREET
NEWBURY ST.
BOYLSTON ST.
HEREFORD ST.
EXETER ST.
DARTMOUTH ST.
CLARENDON ST.
BERKELEY ST.
MOUNT VERNON ST.
CHESTNUT ST.
PUBLIC GARDEN
CHARLES ST.
BOSTON COMMON
MASS. AVE.
COMMERCIAL
FIRST
SECOND
LECHMERE
FEDDER
NASHUA ST. EXT.
MINOT ST.
ALLEN ST.
FRUIT ST.
CHARLES RIVER PARK
CAMBRIDGE ST.
WEEKS BRIDGE
MOUNT VERNON ST.
CCP

COMMONWEALTH OF MASSACHUSETTS
METROPOLITAN DISTRICT COMMISSION
EUGENE C. HULTMAN ~ COMMISSIONER

CHARLES RIVER RESERVATION
PLAN FOR IMPROVEMENT

SCALE OF FEET
100 0 1 2 3 400 600 1200

ARTHUR A. SHURCLIFF ~ LANDSCAPE ARCHITECT
11 BEACON STREET-BOSTON, MASS.

FEBRUARY 12, 1937

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COMMONWEALTH OF MASSACHUSETTS
METROPOLITAN DISTRICT COMMISSION
EUGENE C. HULTMAN – COMMISSIONER

CHARLES RIVER RESERVATION
PLAN FOR IMPROVEMENT

SCALE OF FEET
100 0 1 2 3 400 800 1200

ARTHUR A SHURCLIFF – LANDSCAPE ARCHITECT
11 BEACON STREET – BOSTON, MASS.

FEBRUARY 16, 1937

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T N W 3 W

Unquestionably the automobile has cut down interest in canoeing. The thousands of canoeists who frequented Riverside and other canoeing places on the Charles River have been cut to a few dozen and the business of the canoe liveries has all but vanished. To a lesser extent the same is true with the interest of high school boys and the boys of private schools in the rowing of wherries and shells. Older oarsmen, however, continue their interest and, as we know, the improvements in the Charles River Basin have brought about renewed interest among these men. Meanwhile, college rowing holds its place in undergraduate life and the spectacle of shell racing still attracts public attention. The depression has apparently influenced these college activities less than others.

In the meantime, interest in sailboating has increased, also the interest in power-boating as the many craft of both these types in the Basin and in the upper waters near the Watertown Arsenal attest, not to mention salt water boating off Dorchester and City Point.

In the Charles River Basin the water conditions, though greatly improved on the Boston side for rowing as a result of the construction of sloping shores, are still unfavorable at many seasons and in many winds because of the continuance of the topple waves on the Cambridge side. The conditions are such that persons who are not expert with boats hesitate to use the Basin with small craft because of the uncertainties.

Evidently if increase in the enjoyment of the Basin for boating purposes is to be achieved, the first step should be to improve the water conditions on the Cambridge side.

The Commission also proposes to construct two lagoons in the bend of the river opposite School Street near the Watertown Arsenal. If the interest in boating increases with the installation of these quiet water facilities, the Commission will then feel justified in building a boathouse. In the meantime, the popularity of the lagoon already built in the Charles River Basin at least justifies installation there of facilities to accommodate skaters in the winter season, sailers of model boats in the summer, and the installation of public comfort rooms for general public use.

The activities of the Commission in providing and maintaining bathing facilities on the great bathing beaches of Nahant, Revere, Quincy, and Nantasket, are well known. Bathing facilities have been installed and are being enlarged at Hoosic-whisick Pond in the Blue Hills, at many points in the Charles River Valley and in the Mystic Valley. The interest of the Commission in developing hiking trails in the great reservations is familiar to all members of the Appalachian Mountain Club and others devoted to walking and picnicking. These facilities are constantly being enlarged. The continuous series of ski runs and skiing practice slopes in the Blue Hills also constitutes one of the most recent activities of the Commission, whose ambition is to develop the recreative facilities on water and land at least as rapidly as the public of the Metropolitan Area are ready to make use of such facilities. However, the Commission does not ask the Commonwealth to provide funds for recreative facilities within the boundaries of cities and towns whose duty it is to supply such wants for their own populations from their own budgets.

All who attend the Symphony Concerts given each year on the Esplanade under the direction of Mr. Arthur Fiedler express their appreciation and gratitude for the opportunity of enjoying these free open-air concerts. The audiences are composed of persons who come from the entire Metropolitan area and extend even throughout New England, as these concerts have become one of the outstanding attractions in Boston during the summer seasons. Since the beginning, the expense of carrying them on has been met through the generosity of private individuals interested in this type of entertainment. The Commission is of the opinion that some contribution should be made by the Parks District from the appropriation made annually for band concerts, and recommend that necessary legislation be enacted making this possible.

The cities and towns constituting the Metropolitan Parks District has not been changed since the original Act in 1893. It is hard to understand why the towns of Randolph and Norwood in the southerly area of the district, and the towns of Lexington and Reading in the northerly area of the district were omitted from the original group of municipalities composing the Parks District, as they are closely

allied to the park reservations. The citizens of these towns enjoy the privileges and benefits of the District as much as some of the municipalities now assessed. The Commission recommend these towns be added to the present Metropolitan Parks District.

Further consideration should be given to establishing a public golf course in the vicinity of the Middlesex Fells Reservation for the benefit of residents of the district north of Boston. While this matter is constantly agitated by certain groups, no serious interest is shown and no definite action authorized.

As the Cottage Farm Bridge and the Longfellow Bridge are the only two bridges over the Charles River Basin not under the control of this Commission, it is recommended that the care and control of these bridges be transferred to the Commission; and that the cost of maintenance and operation of them be paid from the Highway Fund, as both bridges are connecting links of heavily travelled highways open to all types of motor vehicles.

Owing to the lack of co-operation of various municipalities in the parks district to keep the land adjacent to the parkways and boulevards zoned against commercial enterprises not in keeping with the purposes for which the parkways and boulevards were established, the Commission recommend that Legislative authorization be given them for complete jurisdiction of all zoning within 500 feet of any roadway or reservation under its control. The limited areas of land owned by the Commission along certain parkways, and the disregard of protests filed by the Commission to the changing of the zoning along these parkways, makes it impossible in some areas to maintain the high type of parkways originally planned for the district.

VI. Special Investigations

In accordance with the provisions of Chapter 26 of the Resolves of 1936, the Metropolitan District Commission were required to make an investigation and report of the following matters:

1. Improvement of Alewife Brook in Cambridge, Somerville and Arlington.
2. Construction of certain roadways in Medford.
3. Improvement of the Mystic River in Medford relative to road traffic conditions near said river.
4. Reconstruction of the Mystic River Bridge, so-called, in Medford and Arlington.

A complete report of these matters, with plans, is printed as House 294.

The Department of Public Health rendered valuable assistance investigating the sanitary conditions for setting off from Lake Cochituate a portion thereof for use for boating and fishing.

In accordance with the provisions of Chapter 14 of the Resolves of 1936, the Metropolitan District Commission were required to make an investigation and report relative to the construction of a beach and public bath house, and the making of other improvements at Hardy Pond in the Lakeview Section of the City of Waltham. The report is printed as House 230.

In accordance with the provisions of Chapter 18 of the Resolves of 1936, the Metropolitan District Commission, the Metropolitan District Water Supply Commission and the Department of Public Health were required to make an investigation and report relative to the setting off of a portion of Lake Cochituate in the Town of Natick for boating and fishing. The report with plan is printed as House 293.

In accordance with the provisions of Chapter 23 of the Resolves of 1936, the Metropolitan District Commission were required to make an investigation and report relative to the improvement for athletic and recreational purposes of certain land of the Commonwealth along the Charles River in the Brighton District of the City of Boston. The report is printed as House 209.

In accordance with the provisions of Chapter 30 of the Resolves of 1936, the Metropolitan District Commission were required to make an investigation and report relative to the acquisition of certain lands in Brookline and Newton for park purposes. The report with plan is printed as House 210.

In accordance with the provisions of Chapter 34 of the Resolves of 1936, the Metropolitan District Commission were required to make an investigation and

report relative to the advisability of constructing and maintaining a bath house at Lake Quannapowitt in the Town of Wakefield. The report is printed as House 211.

In accordance with the provisions of Chapter 53 of the Resolves of 1936, the Metropolitan District Commission were required to make an investigation and report relative to the advisability of constructing an extension of the Woburn Parkway in the City of Woburn. The report is printed as House 231.

VII. Police Department

During the past year the following changes were made in the personnel of the Metropolitan District Police. One Lieutenant was promoted to Captain, one patrolman was promoted to Sergeant and two former members of the department were reinstated as patrolmen. At the end of the year the force was as follows:

1	Superintendent
7	Captains
5	Lieutenants
21	Sergeants
193	Patrolmen
1	Policewoman
3	Call Officers
1	Vacancy (Patrolman)
Total 233	

In addition to the regular force, forty call officers and one temporary policewoman were employed during the summer months.

Officer William J. Elliott was retired October 26, 1936, after twenty-seven years of service.

The Commission has received many commendatory letters from citizens, organizations, cities and towns praising members of the police force and the department as a whole. The following four officers were commended for meritorious work in general orders by the Commission:

Officer Patrick F. Murray	Middlesex Fells Division
Officer William P. Crowe	Charles River Lower Basin
Officer William J. Irwin	Charles River Upper Division
Officer William E. Walsh	Blue Hills Division

Lost property to the value of $23,933.18 was recovered and returned to the owners. 7,605 hours of extra duty without compensation were cheerfully performed by members of the force to care for visitors at special features, such as handling the crowds attending the concerts, regattas, races, football games, etc.

The Department had 2,366 cases before the various courts during the year. Not included in the above number of cases were 39 cases of wayward girls and women handled by the police without court action. 962 of these cases were for offences against the General Laws. 768 were cases of offences against the Motor Vehicle Laws. This number includes 152 cases of operating motor vehicles while under the influence of intoxicating liquor. 624 cases of violations of the rules and regulations of the Metropolitan District Commission were taken before the courts. Of these 129 were against the General Rules and 495 against the Motor Vehicle rules. Fines to the amount of $13,228.00 were assessed by the Courts.

A detail of the above cases will be found in Appendix 3.

During January and February, the department was drilled in marching in accordance with United States Army regulations, under Captain Henry R. Hayes as drill master and Lieutenant T. J. Kelleher as Assistant drill master. These drills were preceded by lectures on such subjects as first aid, criminal law, court procedure, etc. by superior officers of the Department and others. New officers are required to attend a school of instruction before being assigned to street duty.

Sergeant Kenneth Chisholm died on January 16, 1936. He was appointed to the Department on June 1, 1909 and promoted to Sergeant May 24, 1928. At the time of his death, he was assigned to the Charles River Upper Division.

Officer Robert A. Edmonds died on December 23, 1936 from injuries he received while chasing a stolen car on the Blue Hills Parkway.

On March 11, 1936 a Police Headquarters was established at 20 Somerset Street, Boston. A private teletype system for the Department has been installed during the year. Three new combination ambulances and patrol wagons were purchased. Under the supervision of W.P.A. engineers, a radio survey is now being made of the entire Metropolitan District. A radio tower has been erected on the roof of the building of the Commission on Somerset Street, Boston. The top of this antenna is three hundred and twenty-one feet above sea level or fifteen feet higher than the top of Bunker Hill Monument. Two police cars have been equipped with ultra-high frequency radio transmitting and receiving equipment. These cars are now being used for test purposes. Portable two-way radiotelephone equipment is now available for emergency work such as floods, fires, or riots.

On March 20, 1936 orders were received from the Governor to send a detail o officers to the City of Haverhill at once for emergency duty there because of th flood. At once a detail consisting of the Superintendent, one lieutenant, thre sergeants, and fifty patrolmen were dispatched to that city. This detail remaine in Haverhill for three days. Again on March 29, 1936, another detail was sent t Haverhill for that day.

The Executive Department on March 19, 1936, requested a transfer of availabl small boats to flooded districts in the Connecticut Valley for relief work. Twenty small life boats and rowing skiffs with the necessary oars, rowlocks and rope wer immediately loaded on trucks provided by the Department of Public Works fo delivery to the State Police in the stricken areas. Most of this equipment wa returned in good condition, the loss and damage being limited to a value of $172.2 for which the Commission was reimbursed from flood emergency appropriations.

Many letters from officials and civic bodies commending the work and conduc of our officers on these details were received.

The Metropolitan District Police have jurisdiction over police matters in th Water, Sewerage and Parks Districts.

VIII. Metropolitan Water District and Works

The Water District now includes 20 municipalities with an area of about 17 square miles and a population, as of July 1, 1936, of 1,564,080. The Water Work lands include an area of about 19,000 acres, of which about 2,000 acres have bee planted with pine trees.

The works under the control of the Water Division include 9 storage reservoi with 200 square miles of tributary watershed, a total storage capacity of 80 billio gallons and water surface of 8,600 acres; 60 miles of aqueducts; 2 hydro-electr power stations with a combined capacity of 7,000 horse power; 16 miles of high tension power transmission line; 5 distribution pumping stations with a combine equipment of 7,600 horse power and pumping capacity of 340 million gallons a da 12 distribution reservoirs with a capacity of 2.5 billion gallons and 175.17 miles distribution mains. The consumption of water from the Metropolitan Water Work during the year by the 18 municipalities entirely supplied was 48,915,322,0 gallons, equivalent to an average daily consumption of 133,648,400 gallons or gallons per capita for a population of 1,446,450 in the district supplied.

Construction

Improvements for Belmont, Watertown and Arlington

The work of laying the 20-inch pipe lines for improvement of the Intermedia High Service district in Belmont, Watertown and Arlington, which was in progre at the close of 1935, in co-operation with a Federal Works Progress Administrati Project, was continued from Leonard Street in Belmont to the new Intermedia High Service Reservoir on Arlington Heights, and was completed October 2. T work done under this project included the construction of 5,789 linear feet of 2 inch cement-lined cast-iron pipe line and appurtenances; 5,819 linear feet of 2-du electric cable conduit and appurtenances, and the excavation of 1,760 cubic yar of rock under Contract No. 107 with John A. Gaffey and Son.

The work of constructing the Intermediate High Service Covered Reservoir on Arlington Heights was begun July 27 under Contract No. 112 with O'Malley and Delaney. The reservoir is about 160 feet in length and 140 feet in width and has a capacity of about 2 million gallons when filled to a depth of 12 feet. It is constructed of reinforced concrete masonry and is covered with a concrete roof buried with earth about 2 feet in depth, which will be seeded to grass early in the spring.

Work done in constructing the reservoir, which was about 93 per cent completed at the close of the year, included 7,700 cubic yards of earth excavation; 1,765 cubic yards of rock excavation; 4,000 cubic yards of earth embankment and other filling; 2,480 cubic yards of concrete masonry and other miscellaneous items. About 270 linear feet of 20-inch cement-lined cast-iron water pipe, 750 linear feet of smaller cast-iron water pipe and 120 linear feet of 2-duct electric cable conduit were also laid under the reservoir contract.

The work of constructing the Intermediate High Service Pumping Station on Alexander Avenue in Belmont was begun October 26, under Contract No. 113 with the G. L. & C. Company and at the close of the year was about 30 per cent completed.

Contract No. 111 for furnishing and installing the pumping equipment for the station was made with the Turbine Equipment Company of New England. The equipment includes 2 electric motor-operated centrifugal pumping units, each of 3 million gallons per day capacity, and the switchboard and other apparatus. The equipment has been constructed at the shops and is ready for installation when the pumping station shall have been completed early next year.

The expenditures for the Intermediate High Service Works during 1936, amounted to $111,681.07 making a total expenditure of $237,334.07 for the new works to December 31, 1936.

Reinforcement of Low Service Pipe Lines

Contract No. 114 for furnishing and laying 10,200 linear feet of 48-inch welded steel pipe line in Everett and Chelsea, for reinforcing the Low Service Pipe Lines was made with V. J. Grande Company, October 14. Work was begun under the contract on October 19, but on account of unfavorable weather the work was suspended for the winter, December 19, after 704 linear feet of 48-inch pipe had been laid and tested and the trench had been refilled and temporarily resurfaced. The value of the work done amounted to $18,954.60.

Maintenance

Precipitation and Yield of Watersheds

The annual precipitation of 57.30 inches on the Wachusett watershed is 11.82 inches above the average for the past 40 years and has been exceeded only once by a precipitation of 57.92 inches in 1898. A precipitation of 11.04 inches in March is the maximum for any month of the past 40 years on the Wachusett watershed. For the Sudbury watershed the annual precipitation of 54.53 inches is 10.00 inches above the average for the past 62 years and for the Cochituate watershed the annual precipitation of 52.86 inches is 7.89 inches above the average for the past 74 years.

The average daily yield per square mile of the watersheds was 1,547,000 gallons for the Wachusett, 1,332,000 gallons for the Sudbury and 1,238,000 gallons for the Cochituate. These yields are above the average by about 40 per cent on the Wachusett, 37 per cent on the Sudbury and 32 per cent on the Cochituate watershed.

Storage Reservoirs

The capacities of the storage reservoirs of the Metropolitan Water Works, the elevation of the water surfaces and the quantity of water stored in each reservoir at the beginning and at the end of the year are shown by the following table:

Storage Reservoirs	Elevation[1] of High Water to top of flashboards	Total Capacity (Gallons)	Jan. 1, 1936		Jan. 1, 1937	
			Elevation[1] of Water Surface	Available Storage (Gallons)	Elevation[1] of Water Surface	Available Storage (Gallons)
Cochituate Watershed:—						
Lake Cochituate	144.36	2,097,100,000	142.39	1,537,800,000	143.38	1,768,300,000
Sudbury Watershed:—						
Sudbury Reservoir	260.00	7,253,500,000	257.99	5,163,730,000	258.07	5,196,600,000
Framingham Res. No. 1	169.32	289,900,000	167.66	124,420,000	168.06	141,640,000
Framingham Res. No. 2	177.12	529,900,000	176.06	434,320,000	176.38	448,040,000
Framingham Res. No. 3	186.74	1,180,000,000	184.80	863,100,000	184.95	875,050,000
Ashland Reservoir	225.21	1,416,400,000	224.28	949,200,000	224.46	959,100,000
Hopkinton Reservoir	305.00	1,520,900,000	304.01	1,008,020,000	303.33	965,930,000
Whitehall Reservoir	337.91	1,256,900,000	337.65	899,050,000	336.93	759,860,000
Wachusett Watershed:—						
Wachusett Reservoir	396.50	67,000,000,000	382.86	38,560,460,000	389.38	46,566,740,000
Totals	–	82,544,600,000	–	49,540,100,000	–	57,681,274,000

[1] Elevation in feet above Boston City Base.

The total storage capacity shown in the third column of the table is to the bottom of the reservoirs. The available storage shown in columns 5 and 7 is the quantity that can be conveniently used for consumption.

Wachusett Reservoir

At the beginning of the year the water in the reservoir was at elevation 382.86 or 12.14 feet below the designed full reservoir level, elevation 395. The quantity of water in storage was then 49,560,460,000 gallons or about 76 per cent of the full capacity. The water remained at about this elevation until January 3 and then as a result of heavy rains, rose steadily and had reached elevation 386.36 on January 20. The water then receded slightly to elevation 385.79 on March 11 and then rose rapidly, due to warm rains, melting snows and water diverted from the Ware River watershed and water wasted into the Wachusett watershed by the city of Worcester from the Pine Hill Reservoir, and on March 18 the Wachusett Reservoir had filled to normal high-water line, elevation 395. Although water was then allowed to overflow from the reservoir at the waste weir, the water continued to rise in the reservoir until 2:30 P.M. March 19, when elevation 397.01 was reached, and the reservoir contained 67,699,800,000 gallons, the maximum amount of water ever stored in this reservoir. At this time there were no flashboards on the high level portion of the waste weir and but two feet on the low level portion, and the discharge of water at the waste weir for a period of about two hours was at the rate of 3,045,000,000 gallons per day, the maximum rate of discharge over the waste weir and down the waste channel into the Nashua River below the dam, that has occurred since the reservoir was constructed. From March 19 to April 21 water was wasted from the reservoir continuously. During the wasting period and for a few weeks thereafter, there were discharged from the reservoir into the Nashua River below the dam, as waste water and leakage at the flashboards, 17,584,800,000 gallons of water or about 27 per cent of the total capacity of the reservoir. The level of the water in the reservoir remained substantially at elevation 395.5 until May 19 when the draft of water from the reservoir exceeded the inflow and the water level began to recede, and from May 19 until December 6 the water was drawn down at a rate of about 2.15 feet per month. From December 6 to the close of the year, the water rose rapidly due to heavy rains and the diversion of water into the reservoir from the Ware River and Pine Hill Reservoir watersheds. At the close of the year the water in the reservoir was at elevation 389.38 or 5.62 feet below high-water line and the reservoir contained 57,566,740,000 gallons of water or about 89 per cent of its normal capacity and 8,006,280,000 gallons more than at the beginning of the year.

The water discharged into the Wachusett Reservoir watershed by the city of Worcester was received during March, April, May and December and amounted to a total of 1,682,000,000 gallons. The city did not divert any water from Quinapoxet Pond during the year.

The water discharged into the Wachusett Reservoir from the Ware River watershed was received January 4 to 24, inclusive, March 11 to 14, inclusive and December 12 to 31, inclusive, and amounted to a total of 6,613,500,000 gallons.

The town of Clinton pumped 115,800,000 gallons of water from the Wachusett Reservoir during January and the last five months of the year under the provisions of the Acts of 1923, Chapter 348. During the year 612,600,000 gallons of water were discharged from the reservoir into the Nashua River to comply with the provisions of General Laws, Chapter 92, Section 14. This quantity was in addition to that discharged as waste from the reservoir in the spring.

The usual work of cutting and burning brush and weeds growing along about 88 miles of the North and South dikes, sides and margins of adjacent highways, and along brooks and rivers which flow directly into the reservoir, has been done at a cost of $12,880.

New wire fences, enclosing Water Works land in Sterling, were erected for a distance of 3,810 feet along property lines and highways.

To identify the Wachusett Reservoir to the traveling public 12 large wooden signs, 2 feet by 4½ feet, properly inscribed, were erected at conspicuous locations.

The Wachusett Dam and adjacent structures and grounds have been given the usual care. The enormous amount of water flowing down the waste channel during the floods in March dislodged large quantities of rock from the bottom and sides of the channel and deposited it in the Lancaster Mills Pond of the Nashua River below the dam at the mouth of the channel in a large pile which constituted an obstruction to future flows. It was necessary to repair the granite masonry of the waste weir and retaining wall with rubble and concrete footings and to remove 1,440 cubic yards of trash rock from the pile in the Lancaster Mills Pond. This pile was leveled off with a Bulldozer while the pond was drawn down, at a cost of $0.135 per cubic yard.

To care for surface water an old culvert under the lower driveway was rebuilt with 18-inch and 8-inch concrete and vitrified clay pipe and head walls, and a new 4-inch iron pipe culvert laid.

The wooden guard rail fence along the lower driveway was reconditioned for its entire length of 1,200 linear feet by resetting the stone posts and placing a new 4-inch by 5-inch rail. All the driveways and walks were treated with 4,160 gallons of Tarvia.

At the waste weir a new boat landing was built, 24 new stop planks made, and the iron and woodwork painted.

The seven department houses in this Section and the boathouse in Boylston have been kept in good condition. The exterior of the buildings at the Howe place, Sterling Junction, were given one coat of paint and the water system piping replaced; sun porches were added to the Beaven and Kramer houses, Clinton, and the stalls in the Kramer barn were rebuilt.

Contract No. 115, dated September 1, 1936, for constructing a Fish Ladder at the Circular Dam on the Quinapoxet River in West Boylston, was awarded to R. H. Newell & Company. Work was begun on August 31 and completed October 10. The ladder was in service from October 8 to December 15 when it was discontinued for the winter. The water from the Quinapoxet River above the dam drops from 6 to 9 feet to the water in the reservoir below the dam. The ladder consists of ten pools, each 4 feet wide by 9 feet long and about 1 foot deep, built of Portland cement concrete, faced on the reservoir side with Ashlar granite masonry. Each pool is fitted with adjustable flashboard at its lower end, by which the depth in and velocity of water passing through the pool is regulated and there is a wooden control gate at the inlet of the upper pool to control the quantity of water passing down the ladder. Total cost of the work under this contract was $3,503.77.

Sudbury Reservoir

At the beginning of the year the water in the Sudbury Reservoir was at elevation 257.99 or 1.01 feet below the stone crest of the overflow of the dam and at the end

of the year the elevation of the water in the reservoir was 258.07 or 0.93 of a foot below the stone crest of the dam. From January 1 to April 29 when the flashboards were off the spillway, the water in the reservoir varied from elevation 259.92 on March 13 to 256.15 on April 21, or at an elevation averaging about 1.05 feet below the crest of the overflow. From April 30 to November 20 when the flashboards were on the overflow, the water varied from elevation 256.79 on April 30 to 259.77 on July 25, or at an elevation averaging about 0.10 of a foot above the stone crest of the overflow of the dam. The flashboards were off the overflow from November 21 to the end of the year and during this period the water in the reservoir varied from 258.95 on December 13 to 257.30 on December 28, or an average of about 0.67 of a foot below the stone crest of the overflow. Due to heavy rains and the sudden yield of the watershed, water was wasted over the stone crest of the spillway of the dam into Framingham Reservoir No. 3 on January 16 and from March 12 to 15, March 18 to 22 and March 25 to 28, inclusive. A total of 887,800,000 gallons was so wasted.

No water was by-passed at the Sudbury Power Station and with the exception of the 887,800,000 gallons which overflowed at the spillway of the dam into Framingham Reservoir No. 3, all of the water drawn from the Sudbury Reservoir was used to generate electricity.

In order to relieve the ice pressure on the masonry top of the spillway and wing walls, an open channel was cut in the ice in front of the spillway and gatehouse during the winter months.

The heavy rains and flood in the spring did much damage to roadways to Pine Hill and to the nursery; these were repaired by filling in the washouts with gravel.

Fourteen new signs, giving the name of the reservoir, were erected at conspicuous places.

The old building on the property in Fayville, bought of Amilcare M. Pettine, by deed dated April 11, 1936, was torn down, the building being beyond repair. Considerable lumber was salvaged from it, which was stored at the Sudbury Dam for use of the department. The cellar hole was filled in and the grounds graded and seeded.

The grounds and structures at this reservoir have been cared for in the usual manner and necessary repairs have been made.

Framingham Reservoir No. 3

At the beginning of the year the water in this reservoir was at elevation 184.80 and at the end of the year the water was at elevation 184.95. It varied from 182.93 on March 16 to 186.92 on March 20, or at an average of about 0.06 of a foot below the stone crest of the overflow of the dam. The flashboards were kept in place on the overflow throughout the year. The water in this reservoir was maintained at a convenient elevation by drawing water from the Sudbury Reservoir. All of the water drawn through the Sudbury Aqueduct for the supply of the Metropolitan Water District and the town of Framingham was supplied from this reservoir.

Water was wasted from this reservoir from January 20 to 27, inclusive, so that more water from Wachusett Reservoir could be used to improve the quality of the water supply; 463,100,000 gallons was so wasted. From March 12 to April 21, due to heavy rains and excessive yields, water was wasted from this reservoir over the flashboards and through the waste gates; 6,077,800,000 gallons was so wasted. From December 11 to 14, inclusive, a sudden yield caused a waste of 89,800,000 gallons over the flashboards. On December 22 and 23 to protect the flashboards from ice pressure 97,300,000 gallons of water was wasted through the waste gates to lower the water in the reservoir. A total of 6,728,000,000 gallons of water was wasted from the reservoir during the year.

Four new signs, giving the name of the reservoir, were erected at conspicuous places.

The shores of the reservoir have been cleaned and the buildings and grounds have been cared for; the fences and driveways have been repaired and the five-foot lanes along the property lines were mowed and kept free from sprouts and weeds.

Ashland, Hopkinton and Whitehall Reservoirs
and
South Sudbury Pipe Lines and Pumping Station

No water was drawn from the Ashland, Hopkinton or Whitehall reservoirs for consumption during the year. These reservoirs were kept well filled with water and the yield not required for that purpose was wasted into the Sudbury River.

During the cold weather a small flow of water sufficient to prevent freezing was maintained in the pipe line from Whitehall Reservoir to Hopkinton Reservoir from January 1 to February 13 and from November 18 to the end of the year; from February 14 to May 27 a larger flow was maintained through this pipe line partly to keep it from freezing and also to keep the water at a convenient elevation.

Repairs and changes in the attendant's house at Hopkinton Reservoir, begun last year, were completed. This work included the installation of electric fixtures in the house and barn.

The South Sudbury Pipe Lines and Pumping Station were not used during the year to divert water from the South Sudbury watersheds for consumption because of the abundant supply of water of better quality obtained from the Wachusett and North Sudbury watersheds.

Grass lands were mowed, trees and shrubs were kept in good condition, and the lanes along the boundary lines were kept open by cutting and burning brush and weeds.

Framingham Reservoirs Nos. 1 and 2 and Farm Pond

At the beginning of the year the water in Framingham Reservoir No. 1 was at elevation 167.66 and varied from 169.47 on March 13 to 167.33 on August 21, or at an average of about 0.17 of a foot above the stone crest of the overflow of the dam; at the end of the year the water was at elevation 168.06. During the freshet flow on March 12, the discharge over the spillway of the dam at Reservoir No. 1 reached a maximum rate of 1,544,000,000 gallons per day, exclusive of a flow at the rate of 180,000,000 gallons a day through the waste gates.

At the beginning of the year the water in Framingham Reservoir No. 2 was at elevation 176.06 and varied from 177.63 on March 13 to 169.55 on November 14, or at an average of about 0.33 of a foot above the stone crest of the overflow of the dam; at the end of the year the water was at elevation 176.38.

No water was used from these reservoirs for the supply of the Metropolitan Water District or the town of Framingham during the year and the yields of their watersheds were allowed to waste into the Sudbury River below Dam No. 1. A total of 30,914,600,000 gallons was so wasted including the usual flow of 1,500,000 gallons per day into the Sudbury River below Dam No. 1 which was maintained every day throughout the year as required by Chapter 177 of the Acts of 1872.

Framingham Reservoir No. 2 was drawn down to a low elevation in November to allow the town of Ashland to lay a water main across the river just above the Union Street bridge. Waste gates were opened November 5 and closed November 18.

Considerable work was done on the pond hole at the former Neyhart land to improve conditions. Pond lily roots and pads were removed and the shore was cleaned up; several truck loads of pond lily roots were taken by the Parks Division for use in ponds in the Parks Reservations; the remainder of the roots and pads and peat were hauled away by Mr. John R. Macomber for use as fertilizer and mulch. At the end of the summer the conditions were greatly improved.

The five-foot lanes along the property lines at these reservoirs were mowed and weeds and sprouts burned.

Contract No. 68-M, dated November 23, 1936, for rebuilding Fountain Street Bridge in Framingham, was awarded to John A. Gaffey and Son, but at the end of the year no field work had been started.

The town of Framingham pumped 198,383,000 gallons of water from the filter galleries on the shore of Farm Pond during the year.

Under legislative authority the Boston and Albany Railroad used approximately 25,040,000 gallons of water and the New York, New Haven and Hartford Railroad used approximately 6,210,000 gallons of water directly from Farm Pond for use in locomotives during the year.

Lake Cochituate

No water was drawn from Lake Cochituate for the supply of the Metropolita Water District during the year, and to keep the water in the lake at the desire elevation it was necessary to waste 7,402,300,000 gallons during the year.

At the beginning of the year the water in the lake was at elevation 142.39 an varied from 141.51 on March 4 to 144.36 on March 20, or at an average of abou 0.94 of a foot below high water. At the end of the year the water was at elevatio 143.38.

A new cement dam, to replace the wooden one at the lower end of the pool belo the outlet dam, was built; 28 bags of cement were used and the labor cost was $45.0(

The grounds at the outlet dam, gatehouse and around the Foreman's house re ceived the usual care. Brush, weeds and grass were mowed and disposed of alon the brooks and drainage ditches. All cleared land around the lake was mowed an kept free of brush; dead trees were removed from the woods at various places and the five-foot lanes along property lines were mowed and weeds and sprout burned.

Aqueducts

The *Wachusett Aqueduct* was used on 280 days during the year, the total time i service amounting to 122 days, 17 hours and 36 minutes, and the quantity of wate discharged from the Wachusett Reservoir into the aqueduct was 43,254,800,00(gallons, equivalent to an average draft of 118,183,000 gallons per day for the entir year, and all of the water was used to generate electric energy at the Wachuset power station before it was discharged into the aqueduct.

During the year the Westborough State Hospital pumped 89,526,000 gallons o water from the aqueduct terminal chamber in Marlborough, equivalent to an aver age of 245,000 gallons per day.

Brush, grass and weeds were mowed and disposed of for a distance of 10 mile along the aqueduct at a cost of $225 per mile. Wire fences enclosing Water Work land along the aqueduct were constructed for 215 linear feet.

The *Weston Aqueduct* was in use 366 days, the total time in service amounting t 363 days, 7 hours and 12 minutes, and the total quantity of water drawn from th Sudbury Reservoir into the aqueduct for delivery into the Weston Reservoir wa 39,943,300,000 gallons, equivalent to an average of 109,134,699 gallons per day No water was wasted from the aqueduct during the year.

The entire right-of-way from gaging chamber No. 1 to the west portal of tunne No. 4 in Wayland was given the usual care and brush, weeds and grass were mowe and disposed of for the entire length. The buildings along the aqueduct received th usual care and fires were kept in the buildings during cold weather to protect th walls. All manhole covers along the aqueduct were painted and the barn at th White Place was painted.

The *Sudbury Aqueduct* was in continuous use during the year. The entire supply for this aqueduct, 8,396,189,000 gallons, was drawn from Framingham Reservoi No. 3, and of this quantity 332,389,000 gallons was sold to the town of Framinghan and 8,063,800,000 gallons, equivalent to an average of 22,032,240 gallons per day was delivered to Chestnut Hill distribution reservoir. No water was diverted t Lake Cochituate from the aqueduct during the year.

The buildings along the aqueduct were cared for as usual. Fires were kept in th East and West siphon chambers and the gaging chamber during cold weather t protect the brick walls inside. The right-of-way from Hollis Street, Framingham, t Grant Avenue, Newton, was mowed and brush, weeds and grass disposed of. A Echo Bridge the steps and the gravel driveway were repaired and kept in clear condition. The stonework at Echo and Waban bridges was repointed where necessary.

The ditches along both sides of the aqueduct at the gas works in Framingham were deepened and extended about 50 feet and the ditch cleaned, where necessary; bracing was put in to keep the sides of the ditch from caving in. These ditches have kept the tar from getting into the aqueduct. The inside walls show no signs of tar at this place and the gas odor in the aqueduct has disappeared.

Contract No. 69-M, dated November 28, 1936, for replacing old roof of Farm

Pond gatehouse, was awarded to Byron L. Moore and this work was in progress at the end of the year.

The work of reconstructing the stone chimney at the Farm Pond gatehouse was also in progress at the end of the year.

The *Cochituate Aqueduct* was not used during the year but was kept in readiness for use in case of emergency.

The roofs of Dedman's waste weir and of the West pipe chamber have been repaired to stop leaks.

All of the aqueduct lands and structures have been cared for in the usual manner.

Protection of the Water Supply

To prevent pollution of the water supply a Sanitary Engineer and seven watchmen have been employed throughout the year to inspect ice cutting and other operations and the condition of premises on the watersheds and to enforce the sanitary rules and regulations.

Water Division forces have operated the filter-beds on Beaman Street in West Boylston, where the sewage from the Worcester County Training School, which is occupied by about 43 persons, was purified throughout the year. The Gates Terrace filter-beds at Sterling Junction were operated continuously from May 2 to December 31, inclusive, to purify the sewage from summer cottages in that vicinity. Sewage from the Eagleville Mill and the Mount Pleasant House in Holden, from the St. Marks and Fay Schools and the Deerfoot Farm sausage factory and dairy at Southborough was purified by privately-owned and operated filter plants. The effluent from the Fay School filters has, in addition, been sterilized with chlorine by the school.

Water entering Sudbury Reservoir from the small brook which drains the Cherry Street section of Fayville has been chlorinated since May 1.

The overflow from the large cesspool of the Jefferson Manufacturing Company, in Holden, was diverted into a large natural pot hole to keep it out of Eagle Lake.

During the March flood, sewage overflowed from several manholes on the Marlborough main sewer along Mowry Brook. This overflow was sterilized with chlorine before it reached the brook and the brook water was also chlorinated before it entered the Sudbury Reservoir. In compliance with our request the city of Marlborough removed obstructions from the sewer and raised the manholes to a height that should prevent any overflow in the future. The city was reimbursed by the Commonwealth for an expenditure of $367.36 for the work. Other expenditures made by the Commonwealth to protect the purity of the water supply in connection with this occurrence included $851.38 for labor and $398.37 for materials.

A series of cesspools installed by the owner of the Waveney Farm Dairy in Southborough to dispose of the refuse from the milk-room, so that it will not pollute the water in Framingham Reservoir No. 3, has been in satisfactory operation since May 20.

Surface water from thickly settled drainage areas of 525 acres in the village of Sterling; from 1,280 acres along the brook near Maple Street in Marlborough; from 700 acres along Pegan Brook, and an intercepting ditch in Natick was purified by filters operated by Water Division forces before it flowed into the water supply, with the exception of an overflow of 94,000,000 gallons at the Marlborough filters; of 65,530,000 gallons at the Pegan Brook settling basin, and of 164,574,000 gallons from the intercepting ditch in Natick, following heavy rains, which was sterilized with chlorine before it entered the reservoirs.

At the Pegan Brook filters the pumping station was operated on 270 days and 96,231,000 gallons of water was pumped to the filters, an average of 536,150 gallons a day for the entire year. The cost of operating the station and caring for the grounds and filter-beds was $6,436.23 for labor, $423.31 for fuel and $220.23 for supplies and repairs, a total of $7,079.77, which is at the rate of $36.08 per million gallons filtered. The fuel cost per million foot gallons was $0.20.

The cost of protecting the water supply by filtration was $1,407.00 for the Wachusett, $8,705.06 for the Sudbury and $7,079.77 for the Cochituate watershed.

During the year about 69,000 pounds of copper sulphate, which cost about $1,950.00 was applied to the water in two of the storage reservoirs and three of the distribution reservoirs as an algaecide to destroy microscopic organisms including Anabaena, Asterionella, Chlamydomonas, Dinobryon, Mallomonas, Synura and

Uroglenopsis, which occurred in sufficient numbers to give the water an unpleasant taste and odor.

Algaecide was applied to the water in the storage reservoirs, as follows:

At Sudbury Reservoir in May and again in November; on each occasion the reservoir contained about 7,000,000,000 gallons of water; the total amount of copper sulphate used for the two applications was about 40,000 pounds.

At Framingham Reservoir No. 3 in May and again in September; on each occasion the reservoir contained about 1,000,000,000 gallons of water; the total amount of copper sulphate used was about 6,000 pounds.

Algaecide was applied to the water in the distribution reservoirs, as follows:

At Weston Reservoir in May and again in November; on each occasion the reservoir contained about 256,000,000 gallons of water; the total amount of copper sulphate used for the two applications was about 1,400 pounds.

At Spot Pond two applications were made in April and another application was made in November; on each occasion the pond contained about 1,700,000,000 gallons of water; the total amount of copper sulphate used was about 19,000 pounds.

At Chestnut Hill Reservoir in September when the reservoir contained about 660,000,000 gallons of water, about 2,100 pounds of copper sulphate was used.

The amount of copper sulphate applied varied from a minimum of 2.5 pounds to a maximum of 4.3 pounds per million gallons of water.

All water drawn from the storage reservoirs for use in the Metropolitan Water District was sterilized with liquid chlorine before it was delivered into the distribution system. The portion of this water drawn through the Sudbury Aqueduct was sterilized at the chlorinating station near Leland Street in Framingham, and the portion drawn through the Weston Aqueduct was sterilized at the screen chamber in Weston. The total amount of liquid chlorine used in this primary chlorination was 45,961 pounds for 8,063,800,000 gallons, equivalent to 5.70 pounds per million gallons for the Sudbury Aqueduct supply and 173,551 pounds for 39,943,300,000 gallons, equivalent to 4.35 pounds per million gallons for the Weston Aqueduct supply. Portions of the water supply which had passed through open distribution reservoirs after the primary chlorination were again sterilized by secondary chlorination as follows:

A portion of the water supply which had passed through the open distribution reservoirs at Chestnut Hill, after the primary chlorination, was again chlorinated at the Chestnut Hill pumping stations, where 33,439 pounds of liquid chlorine was used for the secondary chlorination of 17,449,000,000 gallons of water, equivalent to 1.92 pounds per million gallons.

Another portion of the water supply which had been exposed in Spot Pond, after the primary chlorination, was again chlorinated at the Spot Pond Pumping Station, where 8,767 pounds of liquid chlorine was used for the secondary chlorination of 4,568,000,000 gallons of water, equivalent to 1.92 pounds per million gallons. The portable chlorinator, formerly used at the Spot Pond Station, was replaced with two permanent machines during the year.

Portions of the water pumped at the Chestnut Hill stations were chlorinated, for a third time, after being exposed in the open high service reservoirs on Fisher Hill in Brookline and on Waban Hill in Newton, where 4,500 pounds of chlorine was used for sterilizing 1,815,000,000 gallons of water, equivalent to 2.47 pounds per million gallons.

On account of the constant variation in the rate of flow of the water at the Fisher Hill and Waban Hill reservoirs, it has been necessary to maintain continuous manual control of the chlorination at these reservoirs during the entire year but early in 1937, after completing the installation, now in progress, of automatic machines for this service, continuous manual control will not be necessary.

In April, there was installed in the screen chamber at Weston Reservoir an electrical device which automatically operates a horn outside the screen chamber and a bell at the foreman's residence in case of loss of water pressure at the chlorinators or of clogging of the screens, and warns the foreman of the trouble either day or night.

Lawrence Basin was out of service June 30 to December 1, inclusive. While it was out of service an unsuccessful attempt was made, July 30, to destroy, with

Merclor furnished without charge by the Merrimac Chemical Company, the organic matter attached to the riprap and bottom of the reservoir, that gave a false reaction to the ortho-tolidin test for residual chlorine, and also to reduce the number of bacteria.

The total expenditure for the chlorine used in sterilizing the water supply was $10,981.44 during 1936.

Improved brook channels, ditches, culverts and watering places were maintained in good order. The cost of maintaining 34 miles of drainage ditches on all of the watersheds was $7,240.00. Considerable work should be done before long in renewing and repairing some of these brook channels.

For the protection of the water supply, property was acquired as follows: In Sterling the fee in 38.14 acres of land and the buildings thereon from James T. Beckwith on January 24; in Southborough the fee in 0.25 of an acre of land from the town of Southborough on November 1, 1935, the fee in 1.53 acres of land from Richard M. McHale on February 5, 1936 and the fee in 0.25 of an acre of land and the building thereon from Amilcare M. Pettine on April 11; in Northborough, Marlborough, Southborough and Westborough the fee in 105 acres of land from Francena E. Buck on August 3 and in Westborough the fee in 3.2 acres of land from Grace L. Earley on May 18.

The work of diverting the water of East Waushacum Pond in Sterling, authorized by Acts of 1934, Chapter 346, which was begun July 12, 1935 in co-operation with the town of Clinton as a Federal Emergency Relief Administration Project and was suspended December 2, 1935, was resumed February 10, 1936 as a Federal Works Progress Administration Project. The work was again suspended from April 27 to June 11 because of lack of Federal funds and from July 10 to July 25 because of lack of Water Division funds. From July 25 to December 7 the work was continued with Federal funds only, which necessitated using hand drills instead of air drills for the rock excavation. The work remaining to be done to complete the project includes the laying of 400 linear feet of 18-inch drain pipe and the building of a small concrete dam. The total expenditures to date for this project includes $5,967.86 by the Commonwealth and $50,336.00 by the Federal Government.

During the year written permits were issued to 1,626 inhabitants of the Metropolitan Water District and of the towns in which certain Water Division reservoirs are located, giving them the right to fish from the shores of the reservoirs under conditions specified in the permits. Of these permits 756 were for fishing in the upper portion of the Wachusett Reservoir more than 2 miles above the outlet and the remainder were for fishing in Whitehall Reservoir, Lombard Mill Pond and Framingham Reservoir No. 2 from which no water was drawn for consumption.

Clinton Sewage Disposal Works

The works constructed under the provisions of Acts of 1898, Chapter 557, for disposing of the sewage of the town of Clinton, were operated on 337 days during the year. The quantity of sewage pumped and disposed of averaged 1,387,000 gallons per day. The cost of operating the pumping station was $4,151.84, which is $8.88 per million gallons, equivalent to $0.178 per million foot gallons. The cost of operating the filters and intercepting sewer was $10,602.57, which is $22.68 per million gallons of sewage disposed of. The works were idle on 28 days in March and April because of the large amount of ground water entering the sewers which, combined with the sewage, exceeded the capacity of the pump, and on one day in December on account of repairs.

Forestry

The plantings made during the year were limited to 20,000 white pine transplants and 1,000 hemlocks in the Wachusett Section and 2,100 arbor vitae and 1,000 spruce trees in the Sudbury Section.

The total expenditure for forestry in 1936 was $31,649.46, of which $4,004.00 was expended for protecting the trees from insects.

Hydro-electric Service

The generation and sale of electric energy as a by-product in connection with the operation of the Metropolitan Water Works was provided for in Acts of 1895, Chapter 488. The Wachusett hydro-electric power station, constructed in 1911, is believed to be the first plant where a public water supply was utilized in this manner.

The hydro-electric power stations at the Wachusett Dam in Clinton and at the Sudbury Dam in Southborough are operated by the water drawn for water supply from the reservoirs above these dams.

During the year 14,074,360 kilowatt hours of electric energy was developed at the power stations.

The value of the energy delivered in 1936 at contract prices was $86,231.45 and deducting $57,349.43, the expenditures charged to the operation of both stations and the Water Division transmission line, there was a profit of $28,882.02.

Wachusett Station

The power station was operated on 280 working days during the year, being idle on 13 days during the first three months of the year and on 12 days in December, on account of water requirements, and on Sundays and holidays.

The statistics are as follows:

Total energy developed (kilowatt hours)	8,726,900	
Energy used at power station (kilowatt hours)	27,533	
Available energy (kilowatt hours)		8,699,367
Water used (gallons)		43,254,800,000
Average head (feet)		91.87
Energy developed per million foot gallons (kilowatt hours)		2.196
Efficiency of station (per cent)		69.89
Credits:		
Energy sold New England Power Company and The Edison Electric Illuminating Company of Boston:		
8,516,535 kilowatt hours at $0.00625	$53,228.34	
Deduction of 2 per cent as provided in contract:		
170,331 kilowatt hours at $0.00625	1,064.57	
	$52,163.77	
Energy furnished Clinton Sewerage Pumping Station:		
182,832 kilowatt hours at $0.00625	1,142.70	
		$53,306.47
Charges:		
Superintendence	$1,919.66	
Labor, operating station	10,154.52	
Repairs and supplies	1,373.80	
Transmission line repairs and supplies	1,999.92	
	$15,447.90	
Taxes	4,575.00	
Administration, general supervision, interest and sinking fund	11,209.01	
		31,231.91
Profit		$22,074.56
Cost of available energy per thousand kilowatt hours		$3.590

Sudbury Station

The Sudbury power station was operated on 366 days during the year with three shifts, although on several days the station was shut down for a short period on account of repairs.

The statistics are as follows:

Total energy developed (kilowatt hours)	5,347,460	
Energy used at power station (kilowatt hours)	79,462	
Available energy (kilowatt hours)		5,267,998
Framingham Reservoir No. 3 service:		
Water used (gallons)		12,062,300,000
Average head (feet)		65.62
Weston Aqueduct service:		
Water used (gallons)		39,943,300,000
Average head (feet)		38.80
Energy developed per million foot gallons (kilowatt hours)		2.284
Efficiency of station (per cent)		72.7
Credits:		
Energy sold The Edison Electric Illuminating Company of Boston:		
5,267,998 kilowatt hours at $0.00625		$32,924.98
Charges:		
Superintendence	$1,820.12	
Labor, operating station	14,876.51	
Repairs and supplies	1,061.53	
	$17,758.16	
Taxes	2,139.00	
Administration, general supervision, interest and sinking fund	6,220.36	
		26,117.52
Profit		$6,807.46
Cost of available energy per thousand kilowatt hours		$4.958

Distribution Pumping Stations

At the five distribution pumping stations 23,392,071,229 gallons of water was pumped during 1936. This is 249,491,815 gallons more than was pumped in 1935.

The pumpage at the two stations at Chestnut Hill included no water for the low service and 17,448,882,827 gallons for the high service during the year. The high service pumpage includes 67,157,000 gallons for a portion of the supply of the town of Brookline, 8,586,000 gallons for the city of Newton and 624,407,344 gallons which was repumped at the Hyde Park Station for the southern extra-high service.

At the Spot Pond Station 4,568,270,362 gallons was pumped for the northern high service and at the Arlington Station 750,510,696 gallons was pumped for the northern extra-high service.

By arrangement with the city of Newton 507,966,000 gallons of water was repumped from the southern high service between November 26, 1935 and October 7, 1936 by the city at its Ward Street booster station for use on the high lands in Belmont and Watertown where satisfactory service could not be furnished from the Chestnut Hill stations, and for this pumping the Commonwealth will pay the city $7,185.31.

The average engine duties at the Water Division stations based on plunger displacement or Venturi meter measurements and the total fuel used at the stations, including heating and lighting the stations and also heating and lighting the garage and shop from Station No. 2 at Chestnut Hill, are as follows:

Chestnut Hill Station No. 1	142,969,993 foot pounds per 100 pounds of oil and coal, averaging 18,000 British thermal units per pound.

Chestnut Hill Station No. 2	166,707,539 foot pounds per 100 pounds of oil and coal, averaging 18,000 British thermal units per pound.
Spot Pond Station	114,115,514 foot pounds per 100 pounds of mixed butuminous and anthracite coal, averaging 14,650 British thermal units per pound.
Arlington Station	96,887,959 foot pounds per 100 pounds of mixed bituminous and anthracite coal, averaging 14,250 British thermal units per pound.
Hyde Park Station	62,337,909 foot pounds per 100 pounds of mixed bituminous and anthracite coal, averaging 14,100 British thermal units per pound.

At the beginning of the year there was 1,060 gross tons of bituminous coal, 70 gross tons of anthracite screenings and 32,313 gallons of oil on hand at the pumping stations, and the amount on hand at the end of the year was 817 gross tons of bituminous coal, 41 gross tons of anthracite screenings and 27,031 gallons of oil. During the year 3,611 gross tons of bituminous coal, 484 gross tons of anthracite screenings and 1,283,016 gallons of oil was burned at the stations.

At Chestnut Hill Station No. 1 the dependent boiler-feed pump on engine No. 1 was relocated and is now operated from an eccentric on the main shaft; 1,470 pump valves were renewed on engine No. 4; the cast-iron body Elliott twin strainer on the fuel oil line was replaced with a new improved steel body twin strainer; new Type A, special hinged, natural-draft registers and wide range oil burners were installed on boilers Nos. 20, 21 and 22, and hand-damper operating devices were also installed on these boilers.

At Chestnut Hill Station No. 2 a new copper expansion joint was installed between the second receiver and the low pressure cylinder; the cast-iron body Elliott twin strainer on the fuel oil line was replaced with a new improved steel body twin strainer; new Type A, special hinged, natural-draft registers and wide range oil burners were installed on boilers Nos. 29, 30 and 31 and hand-damper operating devices were also installed on these boilers. New lead-covered lightning rod equipment was installed on the upper 25 feet of the brick smoke stack, and soot which had collected inside the stack and reduced the flue area was washed down and removed. The brick masonry was repointed on the outside of the stack for a distance of 10 feet down from the top of the stack.

At the Spot Pond Station the usual repairs were made on engines, boilers and economizer.

At the Arlington Station the steel flue was renewed and a number of tubes were replaced in the boilers.

A large amount of miscellaneous work was done at the Carpenter, Blacksmith and Machine shops at Chestnut Hill for the Pumping Service and other Sections of the Water Division.

Distribution Reservoirs

The locations, elevations and capacities of the distribution reservoirs of the Metropolitan Water Works are shown by the following table:

Distribution Reservoirs and Locations	Elevation of High Water[1]	Capacity in Gallons
Low Service:		
Spot Pond, Stoneham and Medford	163.00	1,791,700,000
Chestnut Hill Reservoir, Brighton district of Boston	134.00	300,000,000
Weston Reservoir, Weston	200.00	200,000,000
Mystic Reservoir, Medford	157.00	26,200,000
Northern High Service:		
Fells Reservoir, Stoneham	271.00	41,400,000
Bear Hill Reservoir, Stoneham	300.00	2,450,000
Northern Extra High Service:		
Arlington Reservoir, steel tank, Arlington	442.50	2,000,000
Southern High Service:		
Fisher Hill Reservoir, Brookline	251.00	15,500,000
Waban Hill Reservoir, Newton	264.50	13,500,000
Forbes Hill Reservoir, Quincy	192.00	5,100,000
Forbes Hill Standpipe, Quincy	251.00	330,000
Southern Extra High Service:		
Bellevue Reservoir, steel tank, West Roxbury district of Boston	375.00	2,500,000
Total	–	2,400,680,000

[1]Elevation in feet above Boston City Base.

The Mystic and Forbes Hill reservoirs have been kept full of water for an emergency but were not used during the year.

The Bradlee basin of the Chestnut Hill Reservoir was in service throughout the year but the Lawrence basin was out of service from June 30 to December 1, inclusive, because of objectionable condition of the water therein.

All other distribution reservoirs were in regular service throughout the year.

The standpipes on Arlington Heights, Bellevue Hill and Forbes Hill were in service throughout the year.

Distribution Pipe Lines

The portion of the new 20-inch Intermediate High Service Pipe Line, which extends northerly from the Belmont-Watertown boundary line through Common Street and Leonard Street to Alexander Avenue in Belmont, was sterilized with chlorine and put into service June 29. On nine hot dry summer evenings in July and August during lawn sprinkling periods the pressure on this line was boosted by pumping water from the Weston Aqueduct Supply Main in Pleasant Street into the new main with a fire engine for a few hours in the evening to furnish satisfactory service for the residents on the high land near Common Street in Belmont and Watertown.

Settlements have been made with all of the claimants for damages resulting from the break which occurred October 30, 1935 in the 48-inch water main in Beacon Street at Washington Street in Brookline. The total amount paid to 46 claimants was $13,070.56 or 39.5 per cent of the amount claimed.

During the year, 26 leaks were repaired in the distribution pipe lines at a cost of $2,737.00.

There are now 93 Venturi meters, varying in size from 6 to 60 inches in diameter in the distribution pipe lines; 75 of these are on the connections with the various municipalities in the Metropolitan Water District regularly supplied from the Metropolitan Water Works; 5 are used for measuring the water delivered by the Weston Aqueduct Supply Mains; 7 are used in connection with the operation of 4 of the Department pumping stations and the city of Newton Booster pumping station; there is 1 on a cross connection between the Southern High and Low Service mains; there are 2 on emergency connections with city of Newton mains, 2 on emergency connections with city of Cambridge and town of Wakefield water mains, and 1 measures the water supplied for the State Institutions in Waltham. There are also 11 disc and 16 detector meters in use for measuring small quantities of water supplied at various places.

There are 8 pressure regulating valves connected with the system, 6 of which are in constant use for reducing pressure of water supplied to Revere, Swampscott and Winthrop.

Recording pressure gages have been maintained at 35 places on the distribution system and tables in the Appendix show the hydraulic grade at 17 of these stations as determined by the charts.

Pipes, specials and other materials and supplies required for maintaining and operating the pipe lines are kept on hand at the Glenwood pipe yard in Medford and the Chestnut Hill pipe yard in Brighton.

Auto trucks equipped with gate-operating attachments have been maintained with men on duty ready to operate them in case of emergency at any time during the day or night.

Consumption of Water

During the year 48,915,322,000 gallons of water was furnished to the 18 cities and towns that receive their entire supply from the Metropolitan Water Works. This is equivalent to an average daily consumption of 133,648,400 gallons and for the estimated population of 1,446,450 is at the rate of 92 gallons per capita.

The town of Brookline, with an estimated population of 51,220 used from its local source, 1,706,450,000 gallons of water, of which 409,621,000 gallons was supplied from elevation 375 and 1,296,829,000 gallons was supplied from elevation 250. In addition to this consumption from its local source, the town was supplied with 67,157,000 gallons of water from elevation 250 from the Metropolitan supply, making the total consumption of the town 1,773,607,000 gallons, equivalent to an average daily consumption of 4,845,900 gallons or 95 gallons per capita.

The city of Newton with an estimated population of 66,410, used from its local source 1,817,683,000 gallons of water. In addition to this consumption from its local source, the city was supplied with 8,586,000 gallons of water from the Metropolitan supply, making the total consumption of the city 1,826,269,000 gallons, equivalent to an average daily consumption of 4,989,800 gallons or 75 gallons per capita.

The population, consumption of water and per cent of services metered in the Metropolitan Water District as supplied in 1936 and for the period from 1890 to 1936, inclusive, are shown graphically by the accompanying diagram.

The average daily consumption of water in each of the municipalities in the Metropolitan Water District during 1935 and 1936 is as follows:

	Estimated Population, 1936	Average Daily Consumption				
		1935		1936		Increase in Gallons
		Gallons	Gallons per Capita	Gallons	Gallons per Capita	
Arlington	39,320	2,218,000	57	2,196,900	56	21,100[1]
Belmont	25,800	1,373,200	55	1,383,900	54	10,700
Boston	829,250	87,868,000	107	90,112,100	109	2,244,100
Chelsea	41,680	3,329,300	79	3,240,100	78	89,200[1]
Everett	46,860	4,428,900	94	4,553,600	97	124,700
Lexington	11,230	703,000	64	667,500	59	35,500[1]
Malden	57,040	3,923,300	69	3,912,800	69	10,500[1]
Medford	61,980	3,598,200	58	3,290,100	53	308,100[1]
Melrose	24,610	1,567,800	64	1,517,300	62	50,500[1]
Milton	18,690	891,300	49	1,005,300	54	114,000
Nahant	1,780	258,500	147	217,500	122	41,000[1]
Quincy	78,470	5,054,600	65	5,306,200	68	251,600
Revere	35,200	2,264,100	64	2,135,500	61	128,600[1]
Somerville	99,780	8,695,500	87	9,351,600	94	656,100
Stoneham	11,080	711,900	65	692,500	63	19,400[1]
Swampscott	10,520	893,200	85	852,000	81	41,200[1]
Watertown	36,120	2,160,200	60	2,058,000	57	102,200[1]
Winthrop	17,040	1,195,100	70	1,155,500	68	39,600[1]
District Supplied	1,446,450	131,134,100	91	133,648,400	92	2,514,300
Brookline	51,220	4,792,200	95	4,845,900	95	53,700
Newton	66,410	4,784,500	72	4,989,800	75	205,300
Total District	1,564,080	140,710,800	91	143,484,100	92	2,773,300

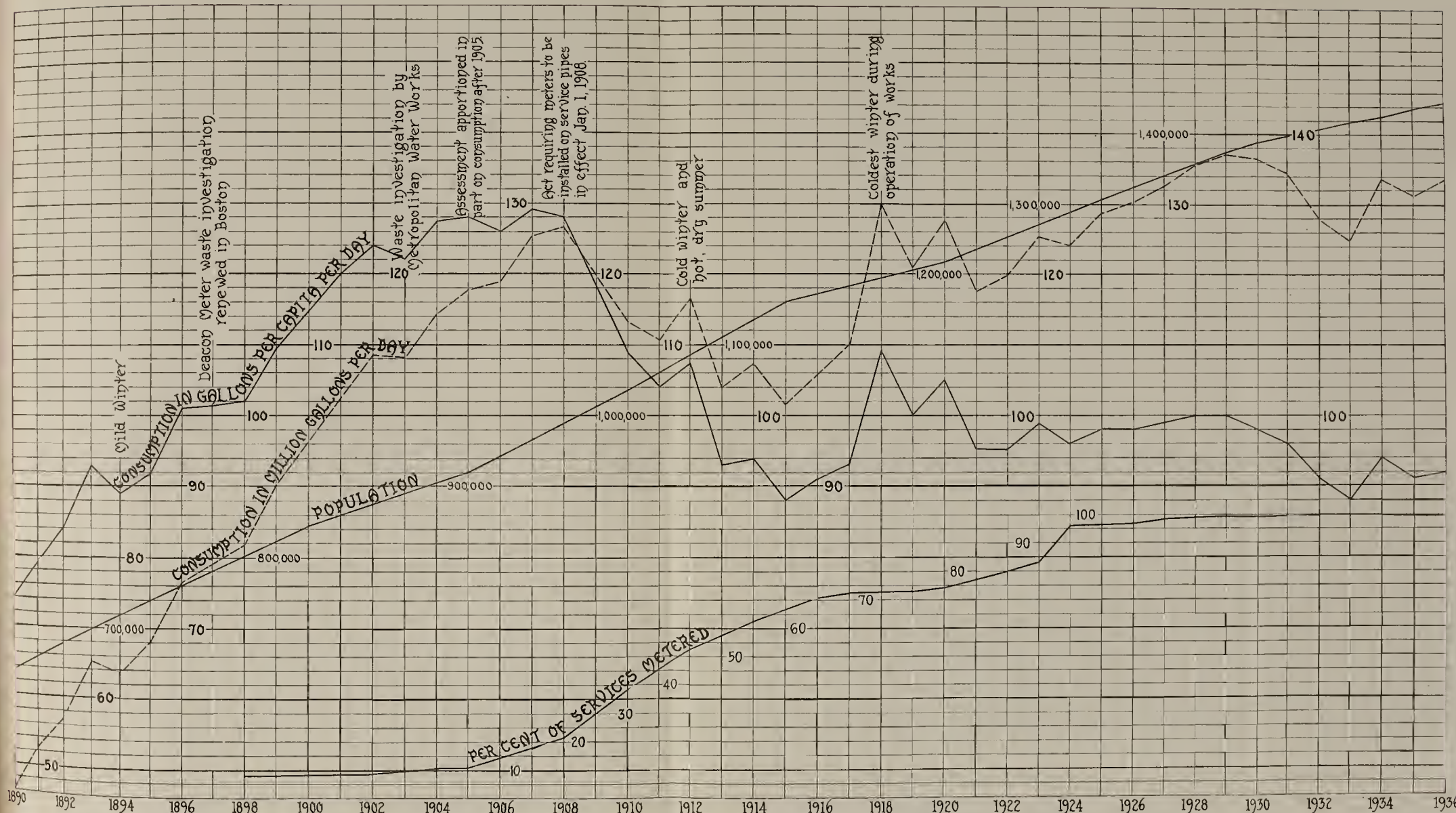
[1]Decrease.

The consumption by districts in 1936 as compared with 1935 is as follows:

	Gallons per Day 1936	Increase from 1935	
		Gallons per Day	Percentage
Low service district, embracing the low-service districts of Arlington, Belmont, Boston, Chelsea, Everett, Malden, Medford, Somerville and Watertown	68,695,000	1,815,800	2.72
Southern high-service district, embracing Quincy, the high-service district of Boston, except East Boston, and portions of Milton and Watertown	46,841,700	816,700	1.77
Intermediate high-service district, embracing portions of Belmont and Watertown	1,498,300	19,100	1.29
Northern high-service district, embracing Melrose, Nahant, Revere, Stoneham, Swampscott, and Winthrop and the high-service districts of Chelsea, East Boston, Everett, Malden, Medford and Somerville	12,757,700	242,000[1]	1.86[1]
Southern extra high-service district, embracing the higher portions of Hyde Park, Milton and West Roxbury	1,816,400	145,900	8.73
Northern extra high-service district, embracing Lexington and the higher portions of Arlington and Belmont	2,039,300	41,200[1]	1.98[1]
District Supplied	133,648,400	2,514,300	1.92
Brookline and Newton	9,835,700	259,000	2.70
Total District	143,484,100	2,773,300	1.97

[1]Decrease.

POPULATION, CONSUMPTION OF WATER AND PER CENT OF SERVICES METERED IN THE METROPOLITAN WATER DISTRICT AS SUPPLIED IN 1936 FROM 1890 TO 1936



Note: Estimated population and consumption per capita given on diagrams published in previous annual reports are revised from time to time as regular census figures become available.

Water from Metropolitan Water Works Sources used Outside of the Metropolitan Water District—1936

Places where Water is Used	Total Quantity (Gallons)	Average Quantity (Gallons per Day)	Amount Charged
Town of Rutland	89,773,600*a*	245,300	–
Town of Holden	33,581,100*b*	91,800	–
Towns of Clinton and Lancaster	115,800,000*c*	316,400	–
Town of Sterling	3,568,000*d*	9,700	–
Westborough State Hospital	89,526,000	245,000	$2,685.78
Town of Westborough	75,000,000	205,000	–
Town of Southborough	27,773,900	75,900	–
Town of Ashland	87,670,100	239,500	–
Town of Hopkinton	28,296,300	77,300	–
Town of Framingham	530,772,000	1,450,200	13,676.45
Town of Natick	338,000,000	923,500	–
United States Army Reservation at Peddock's Island in Hull	544,000*e*	1,500	65.25
Portion of Town of Saugus	1,588,000*f*	4,300	–
Metropolitan Parks, Middlesex Fells	6,300,000	17,200	–
Metropolitan Parks, Revere Beach Bath House	146,000*g*	400	–
Walter E. Fernald State School and Metropolitan State Hospital	165,443,000*h*	452,000	18,049.83

Notes:—Water was used throughout the year in all places except as noted.
The average daily use is in all cases figured on basis of 366 days.
*a*All but 403,900 gallons diverted from watershed.
*b*157,100 gallons diverted from watershed.
*c*Water was used on 145 days during the months of January and August to December, inclusive.
*d*731,900 gallons diverted from watershed. System placed in service in December, 1935.
*e*Water supplied by the Commission through City of Quincy pipes, and by agreement revenue is divided in equal shares between the City and Commonwealth.
*f*The City of Melrose supplies the water and pays the Commonwealth by an addition to its regular apportionment.
*g*Connection installed July 31, 1936.
*h*For fiscal year ending November 30.

Information regarding the installation of meters on service pipes by the municipalities supplied with water from the Metropolitan Water Works for the year 1936 and other statistics are given in tables in the Appendix.

IX. Metropolitan Sewerage Districts

Areas and Populations

The populations of the districts, as given in the following table, are based on the census of 1935.

Table showing Ultimate Contributing Areas and Present Estimated Populations within the Metropolitan Sewerage Districts, as of December 31, 1936

	City or Town	Area (Square Miles)		Estimated Population	
North Metropolitan District	Arlington	4.73		39,570	
	Belmont	3.78		26,940	
	Boston (portions of)	3.45		95,120	
	Cambridge	5.43		119,940	
	Chelsea	2.07		41,340	
	Everett	2.92		46,730	
	Lexington	15.98		11,370	
	Malden	4.16		56,960	
	Medford	6.11		62,170	
	Melrose	3.81		24,720	
	Reading	9.76		11,100	
	Revere	5.55		35,170	
	Somerville	3.96		99,450	
	Stoneham	4.27		11,170	
	Wakefield	6.36		16,570	
	Winchester	5.31		13,650	
	Winthrop	1.61		17,060	
	Woburn	12.23		19,810	
			101.49		748,840
South Metropolitan District	Boston (portions of)	24.96		325,880	
	Braintree	13.44		17,710	
	Brookline	5.35		51,500	
	Canton	17.84		6,800	
	Dedham	9.66		15,470	
	Milton	9.59		18,870	
	Needham	11.44		12,240	
	Newton	16.00		66,500	
	Norwood	10.16		15,790	
	Quincy	11.46		78,990	
	Stoughton	16.23		8,600	
	Walpole	20.81		7,520	
	Waltham[1]	11.40		43,390	
	Watertown	3.83		36,220	
	Wellesley	9.89		14,190	
	Weymouth	16.46		22,110	
			208.52		741,780
	Totals		310.01		1,490,620

[1]Including 2280 in the Metropolitan State Hospital and the Middlesex County Tuberculosis Hospital authorized by Chapter 372 of the Acts of 1928 and Chapter 373 of the Acts of 1929.

Metropolitan Sewers

Sewers Purchased and Constructed and Their Connections

During the year there have been 6.031 miles of Metropolitan sewers built within the sewerage districts, so that there are now 148.623 miles of Metropolitan sewers. Of this total, 9.642 miles of sewers, with the Quincy Pumping Station, have been purchased from cities and towns of the districts. The remaining 138.981 miles of sewers and other works have been constructed by the Metropolitan Boards.

The locations, lengths and sizes of these sewers are given in appendix tables, together with other data referring to the public and special connections with the systems.

Maintenance

Scope of Work and Force Employed

The maintenance of the Metropolitan Sewerage System includes the operation of 10 pumping stations, the Nut Island screen-house and 148.623 miles of Metropolitan sewers, receiving the discharge from 2082.66 miles of town and city sewers at 1454 points, together with the care and study of inverted siphons under streams and in the harbor.

At present the permanent maintenance force consists of 195 men, of whom 117 are employed on the North System and 78 on the South System. These are subdivided as follows: North Metropolitan System, 75 engineers and other employees in the pumping stations and 42 men, including foremen, on maintenance, care of sewer lines, buildings and grounds; South Metropolitan System, 52 engineers and other employees in the pumping stations and 26 men, including foremen, on maintenance, care of sewer lines, buildings and grounds.

The regular work of this department, in addition to the operation of the pumping stations, has consisted of routine work of cleaning and inspecting sewers and siphons, caring for tide gates, outfall sewers, regulators and overflows, measuring flow in sewers, inspection of connections to the Metropolitan sewers, and the care of pumping stations and other buildings, grounds and wharves.

In addition to these regular duties, other work has been done by the maintenance employees in this department as follows:

Deer Island Pumping Station

At this station a cracked check-valve on the discharge of No. 3 Pump was removed and replaced with a new one and new crank-pin boxes were placed on No. 4 Engine. The pipes discharging water from the condensing pumps of Engines No. 1 and No. 2 and the rain water from the down spouts have each been extended 12 feet on the beach. In recent years these pipes have filled so that the discharge ends were partially covered with sand and fine gravel.

The strainer on the suction pipe for the condensers of No. 1 and No. 2 Engines was cleaned and a chain pulled through the pipe and left in so that it can be used in partially cleaning the pipe in the future. A wooden frame with cover was built up around the manhole connecting with the condenser suction pipe in order to facilitate the uncovering of it in the future.

An asphalt surface was placed on the dirt road in front of the station. This was necessary because in dry hot weather dust from the road caused grit and dirt to blow into the station doing gradual harm to the exposed moving parts of the pumping machinery and in addition caused inconvenience in keeping the interior of the station clean.

New floors and railings have been put on the lower piazzas of the four apartment tenement house by the carpenters of the maintenance force and they have also made such repairs to the floors and walls as were made necessary by the installation of new plumbing done by contract. One apartment has been painted and some painting has been done in the others which was made necessary by the installation of the plumbing.

The north ell of the barn has been set on a new concrete foundation, the old brick foundation having settled badly, and the building has been pulled into line and plumbed and boarded. Pipes and coils for heating have been installed and the steam heat turned on. A concrete floor has been installed and outside carpenter work completed except for the hanging of the doors, the hardware for which has not yet been received. Inside posts and studding for a partition have been put in place and some sheathing has been done. The new work has been painted.

East Boston Pumping Station

At this station during the year numerous minor repairs and replacements of worn parts of the engines, pumps, boilers, steam and water pipe lines and valves were made, largely by the regular station employees. A considerable part of this work was upon Pumping Engines No. 2 and No. 3 and their accessories. Repairs by welding were made upon the boilers when necessary.

The Holly System was overhauled and four new valves put in the line.

A new oil pump for the thrust bearing of No. 4 Pump was set up and the shaft so connected as to be driven by a belt from the counter-shaft of the engine. This takes the place of the motor driven pump.

One of the fuel economizers was taken apart and the tubes cleaned. On the economizer engine both the cross-head pin and the crank-pin were turned down and the boxes fitted.

The flues from Boilers No. 1, No. 3 and No. 5 were cleaned and these boilers were inspected by the State Boiler Inspector.

For some years past the screenings from the sewage have been dumped on the lot between Chelsea Creek, the Boston & Albany Railroad and Eastern Avenue in Chelsea, and covered with ashes and other material making a considerable area for storage on what was formerly tidal flats. The taking of this Chelsea lot by the city of Boston for the purpose of constructing the new bridge over Chelsea Creek made it necessary to resume the pressing and burning of the screenings at the station. A new ¾ inch steam pipe with the necessary valves was run to the presses in the screen room, new piston rings were installed on the presses and they were put in operation about the middle of March.

A new sleeve was put in on the water end of the salt-water pump supplying Pits No. 1, No. 2, and No. 3. The tank holding salt water for condensing was welded around the bottom head and the 12 inch suction pipe for the condensers was inspected, the strainer was cleaned and all put in good condition for the winter.

A new coal cart was made for use in the boiler room.

An asphalt surface was placed on the dirt road in front of the station. This was necessary because in dry, hot weather dust from the road blew into the station doing gradual harm to the exposed moving parts of the pumping machinery and causing additional trouble in keeping the interior of the station clean.

The construction of a new highway bridge over Chelsea Creek necessitated the removal of all of our buildings on the East Boston side of the Creek between Chelsea Street, Addison Street, and the Boston & Albany Railroad tracks. All the buildings except the concrete locker building were torn down by the contractor for the bridge and everything in the buildings, except on the upper floor of the locker building, was moved and stored mostly in the pumping station. The garages have been rebuilt on a new lot, recently acquired, south of the pumping station, and are now housing the motor vehicles again. The concrete building was moved across the tracks by men employed by the contractor for the bridge and set on a foundation built for it on the opposite side of Addison Street, from the pumping station and close to the Boston & Albany Railroad line. A wire fence was built around the new lot and a new metal covered door and bars across the windows were added to the store room for additional security. The building was painted. A 1½ inch brass pipe for steam, a 1 inch brass pipe for cold water and a ½ inch brass pipe for hot water have been laid from the station to this building. An electric cable for power has been run to the carpenter shop and the motor repaired. The electric light fixtures have been installed and the plumbing restored.

The concrete locker building on the Chelsea lot was painted on the outside.

A Bundy steam trap was set up in the locker building in connection with the heating system.

Charlestown Pumping Station

At this station the brickwork was removed from around the northerly pair of boilers to permit their removal. Two new horizontal Boilers No. 3 and No. 4, furnished by the D. M. Dillon Steam Boiler Works, Incorporated, were placed in position on blocking ready for the brick masonry to be rebuilt around them. The masonry was completed in May.

The blow-off pipes from all the boilers were replaced with new brass pipes.

A portion of the brick setting around Boilers No. 1 and No. 2 was removed where cracked. This will be rebuilt when the I-beams which have been ordered are received.

A piece of joist caught in No. 3 Pump and caused a crack about 3 feet long in the lower quarter of the casing. This was repaired by filling the pit with concrete to about the level of the center of the casing.

A cross-head pin for the high pressure cylinder of No. 3 Engine was built up and refitted together with the boxes. Engine Pits No. 1 and No. 2 were cleaned and painted.

A 4 inch by 4 inch angle iron was bolted as a stiffener to the bottom of one of the screens which frequently buckled when dropped. The plank platforms over the screens have been replaced with new ones.

New wiring and fixtures were installed on the lighting system.

Alewife Brook Pumping Station

The valves in the condenser pump were renewed.

The hangers on the check valve on the main discharge line were rebored and new bushings put in and a new rod made for the hinge so that the check valve is now in first class working order.

The high pressure valves on the steam main were repaired.

The low pressure piston of No. 2 Engine was removed and new springs put in back of the rings and the follower plate cut to fit the rings more closely. New packing was put in No. 3 Engine, new valve rods were made, crank and cross head bearings on the high pressure side were put in order and a new valve stem installed. The check valve on the discharge from this engine was reconditioned.

Plungers on the feed pumps were repaired and Boiler No. 1 was cleaned and prepared for inspection by the State Boiler Inspector. Twelve feet of 1 inch brass pipe were put in the feed line to the boilers.

Valves and packing were renewed in the water end of No. 2 Air Pump.

A steam coil and two additional radiators for heating the lower portion of the barn were installed and the wiring for the lights renewed, following the completion of a new ceiling. The flooring of the room where the horse stall was located was taken out and a room for the use of the maintenance men made to take the place of the upstairs room which had been made into an office for the use of the engineers connected with the sewer project under construction in the North Metropolitan District. A new toilet and sink were installed and clothing lockers made and set up and the room painted.

Reading Pumping Station

At this station an 8 inch I-Beam was bolted to the under side of the basement floor and to an I-Beam about 5½ feet below it to which a pump shaft bearing is attached to prevent vertical vibration of the bearing.

A piece of wood about 9 inches long and 3 inches square got into the larger pump and stuck in the discharge pipe. This gathered rags and other material until the discharge was reduced to about one-quarter of the usual quantity. The pump was taken apart and the obstruction removed.

The inside of this station was painted.

The new 2-inch water supply pipe from the Wakefield water main recently laid to this station, was connected in June.

The reservoir was thoroughly cleaned.

Sewer Lines

At Portland and Main Streets, Cambridge, where the Metropolitan Sewer is siphoned under the rapid transit subway, a 36-inch sluice gate became inoperative by the wearing and stripping of the threads in the thrust nut. To replace this nut, a slot was cut in the manhole top and the entire gate was lifted out and taken to our machine shop at the Ward Street Pumping Station where the repairs were made and the gate was then put back in place.

New stop planks have been put in at the Winthrop Street overflow in Medford by the maintenance force at the Alewife Brook Pumping Station.

Ward Street Maintenance Yard

The large portable field office which was formerly located near Paul's Bridge in Milton for the use of the engineers on Section 31, Hyde Park Branch, has been set up in this yard. A cement concrete floor was installed, the inside was lined with plaster board and the outside was covered with gravelled roofing paper, making it to a certain degree fireproof. Shelves have been built along each of the sides for the temporary storage of records from the Boston Office.

Considerable work was done around the station and yard in remaking lawns.

A new picket fence was built around two sides of the yard replacing the old fence of the same type.

Nut Island Screen House

Two new vertical tubular boilers were furnished and installed with smoke flue connections by the D. M. Dillon Steam Boiler Works, Incorporated.

The carpenters have completed construction and hanging of new doors.

Sewer Lines

The 30-inch connection in Lee Street, Hough's Neck, Quincy, for which a permit was issued September 10, 1935, was made on October 24th of this year. The portion of this Quincy sewer from Lee Street, northwesterly, through Sea Street is still too leaky to be connected and is now stopped off by a brick bulkhead. The remaining portion, about four miles of sewer, was connected with the Metropolitan sewer.

A large amount of brush was cut over the lines of the New Neponset Valley sewer.

Several manholes were raised to meet the established grade of filling about to be placed, one being in Fairview Cemetery, Hyde Park, one in St. Joseph's Cemetery, West Roxbury, one at the easterly entrance of the plant of Bird & Son in Norwood and one in Colburn Street, Dedham.

In Forge Pond, Canton, two manholes had become exposed due to ice action in the past winter. This fill was replaced.

During the record floods of March, every sewer in the South System was running to capacity and many were surcharged.

At Dedham Street, Canton, an overpass was constructed by the Department of Public Works. This work necessitated a fill of 20 feet to be placed over a portion of the Metropolitan sewer and the raising of one of the manholes by the Contractor.

Gasoline in Public Sewers

During the year the usual precautions have been maintained against the introduction of gasoline into the Metropolitan sewers. An inspector who covers both North and South Metropolitan Sewerage Districts has been employed. His duties are to see that all newly constructed garages or other gasoline-using establishments are supplied with a proper gasoline separator and also to see that these separators are kept in working condition.

During the year 1936 the number of permits issued by the municipalities in the Sewerage Districts for the construction of garages and other places where gasoline is used was 228. Each of these permits necessitates an examination by our inspector. Many of them are attended to through the mails and do not require a personal visit. Visits are made, however, to all locations where a connection is to be made with the public sewerage system and to such places as do not respond to the return postal cards sent out. During the year 21 such places were connected with the sewers that empty into the Metropolitan Systems. At the present time there are according to our records 1721 garages and other establishments where gasoline is used connected with the local sewerage systems which discharge into the Metropolitan sewers.

This system of inspection has improved the gasoline situation in regard to the danger to the sewers. Occasionally odors of gasoline are detected in the sewers. These are reported to the Department of Public Safety which alone has statutory control of the distribution and handling of gasoline in the Commonwealth.

PUMPING STATIONS

Capacities and Results

North Metropolitan System

Deer Island Pumping Station

At this station are four submerged centrifugal pumps with impeller wheels 8.25 feet in diameter, driven by triple-expansion engines of the Reynolds-Corliss type.
Contract capacity of 1 pump: 100,000,000 gallons, with 19-foot lift.
Contract capacity of 3 pumps: 45,000,000 gallons each, with 19-foot lift.
Average coal duty for the year: 63,000,000 foot pounds.
Average quantity raised each day: 86,400,000 gallons.
Maximum quantity raised per day: 161,400,000 gallons.

East Boston Pumping Station

At this station are four submerged centrifugal pumps, with impeller wheels 8.25 feet in diameter, driven by triple-expansion engines of the Reynolds-Corliss type.
Contract capacity of 1 pump: 100,000,000 gallons with 19-foot lift.
Contract capacity of 3 pumps: 45,000,000 gallons each, with 19-foot lift.
Average coal duty for the year: 62,500,000 foot pounds.
Average quantity raised each day: 84,400,000 gallons.
Maximum quantity raised per day: 159,400,000 gallons.

Charlestown Pumping Station

At this station are three submerged centrifugal pumps, two of them having impeller wheels 7.5 feet in diameter the other 8.25 feet in diameter. They are driven by triple-expansion engines of the Reynolds-Corliss type.
Contract capacity of 1 pump: 60,000,000 gallons with 8-foot lift.
Contract capacity of 2 pumps: 22,000,000 gallons each, with 11-foot lift.
Average coal duty for the year: 55,000,000 foot pounds.
Average quantity raised each day: 45,000,000 gallons.
Maximum quantity raised per day: 69,300,000 gallons.

Alewife Brook Pumping Station

The pumping units in this station consist of one Andrews pump driven by a compound marine engine, one Morris pump and Morris compound engine and a specially designed engine of vertical cross-compound type having between the cylinders a centrifugal pump rotating on a horizontal axis.
Contract capacity of the Andrews pump: 4,500,000 gallons with 13-foot lift.
Contract capacity of Morris pump: 8,000,000 gallons with 15-foot lift.
Contract capacity of the special pump: 13,000,000 gallons with 13-foot lift.
Average coal duty for the year: 25,500,000 foot pounds.
Average quantity raised each day: 7,850,000 gallons.
Maximum quantity raised per day: 18,040,000 gallons.

Reading Pumping Station

At this station are two submerged centrifugal pumps, one of 2,500,000 gallons per 24 hours, and one of 4,000,000 gallons per 24 hours, capacity. These operate against a maximum head of 65 feet, and are actuated by vertical shafts directly connected with 75 and 100 horse-power motors.
Alternating current of 440 volts furnished by the town of Reading is used.
Average quantity pumped per 24 hours: 1,320,000 gallons.
Maximum quantity raised per day: 4,000,000 gallons.

South Metropolitan System

Ward Street Pumping Station

At this station are two vertical, triple-expansion pumping engines, of the Allis-Chalmers type, operating reciprocating pumps, the plungers of which are 48 inches

in diameter with a 60-inch stroke and one 50,000,000-gallon centrifugal pumping unit actuated by a 500 H.P. Uniflow engine.
Contract capacity of 3 pumps: 50,000,000 gallons each, with 45-foot lift.
Average coal duty for the year: 77,200,000 foot pounds.
Average quantity raised each day: 35,100,000 gallons.
Maximum quantity raised per day: 57,600,000 gallons.

Quincy Pumping Station

The plant at this station consists of one Lawrence centrifugal pump driven by a Sturtevant compound condensing engine, one Morris centrifugal pump driven by a Morris compound condensing engine, and one DeLaval centrifugal pump driven by a Fitchburg vertical uniflow engine.
Contract capacity of 3 pumps: Lawrence centrifugal, 10,000,000 gallons; Morris centrifugal, 10,000,000 gallons; DeLaval centrifugal, 15,000,000 gallons.
Average coal duty for the year: 38,000,000 foot pounds.
Average quantity raised each day: 8,910,000 gallons.
Maximum quantity raised per day: 33,650,000 gallons.

Nut Island Screen-house

The plant at this house includes two sets of screens in duplicate actuated by small reversing engines of the Fitchburg type. Two vertical tubular boilers, 80 horse-power each, operate the engines, provide heat and light for the house, burn materials intercepted at the screens, and furnish power for the Hough's Neck pumping station.
Average daily quantity of sewage passing screens: 96,500,000 gallons.
Maximum quantity passing screens per day: 265,000,000 gallons.

Hough's Neck Pumping Station

At this station are two 6-inch submerged Lawrence centrifugal pumps with vertical shafts actuated by two Sturtevant direct-current motors.

The labor and electric energy for this station are supplied from the Nut Island Screen-house, and as used at present it does not materially increase the amount of coal used at the latter station.
Average quantity raised each day: 252,000 gallons.
Maximum quantity raised per day: 474,000 gallons.

Squantum Pumping Station

At this station are two pumping units each consisting of a 10-inch submerged DeLaval centrifugal pump with vertical shaft actuated by a Crocker-Wheeler 60 H.P. motor. Each unit is capable of lifting 4,000,000 gallons of sewage per 24 hours against a head of 46 feet.

The electric energy for this station is purchased from the Quincy Electric Light & Power Company.
Average quantity raised each day: 163,000 gallons.

Braintree-Weymouth Pumping Station

At this station are two pumping units consisting of DeLaval centrifugal pumps actuated by 150 H.P. direct connected Winton diesel engines, together with all accessories appertaining thereto. Each unit is capable of lifting 15,000,000 gallons of sewage per 24 hours against a head of 30 feet.

Average quantity raised per day: 322,000 gallons.

Average Daily Volume of Sewage lifted at Each of the Ten Metropolitan Sewerage Pumping Stations during the Year, as compared with the Corresponding Volumes for the Previous Year

Pumping Station	Average Daily Pumpage			
	Jan. 1, 1936 to Dec. 31, 1936	Jan. 1, 1935 to Dec. 31, 1935	Increase during the Year	
	Gallons	Gallons	Gallons	Per Cent.
Deer Island	86,400,000	82,900,000	3,500,000	4.22
East Boston	84,400,000	80,900,000	3,500,000	4.33
Charlestown	45,000,000	42,400,000	2,600,000	6.13
Alewife Brook	7,850,000	6,140,000	1,710,000	27.85
Reading	1,320,000	1,260,000	60,000	4.76
Quincy	8,900,000	7,260,000	1,640,000	22.59
Ward Street (actual gallons pumped)	35,100,000	33,900,000	1,200,000	3.54
Hough's Neck	252,000	261,000	9,000*	3.45*
Squantum	163,000	132,000	31,000	23.48
Braintree-Weymouth	322,000	304,000	18,000	5.91

*Decrease.

Metropolitan Sewerage Outfalls

The Metropolitan Sewerage Districts now have outfalls in Boston Harbor at five points, two of which may discharge sewage from the North District and three from the South District.

During the year the sewage of the North District has been discharged wholly through the outlet located near Deer Island light. The other outfall of this system is closed by a cast-iron cover which can easily be removed. This outfall was examined by diver on November 4, 1936, who reported that the cover while slightly out of place, covered the pipe and by putting in a couple of extra pins, it was safe for the winter.

Of the outfalls of the South District, two extend for a distance exceeding one mile from the shore of Nut Island, Quincy, and the third one, called an emergency outlet, extends about 1,500 feet from the same. It was necessary to discharge sewage through this outfall 929 hours during the year.

During the year the average flow through the North Metropolitan District outfall at Deer Island has been 86,400,000 gallons of sewage per 24 hours, with a maximum rate of 161,400,000 gallons during a stormy period in March, 1936. The amount of sewage discharged from the North Metropolitan District averaged 129 gallons per day for each person, taking the estimated population of the District contributing sewage. If the sewers in this District were restricted to the admission of sewage proper only, this per capita amount would be considerably decreased.

In the South Metropolitan District an average of 96,500,000 gallons of sewage per 24 hours has passed through the screens at the Nut Island screen-house and has been discharged from the outfalls into the outer harbor. The maximum rate of discharge per day which occurred during a stormy period in March, 1936, was 165,000,000 gallons. The discharge of sewage through these outfalls represents the amount of sewage contributed by the South Metropolitan District, which was at the rate of 179 gallons per day per person of the estimated number contributing sewage in the District.

Material Intercepted at the Screens

The material removed from the sewage at the screens of the North Metropolitan Sewerage Stations, consisting of rags, paper and other floating materials, has during the year amounted to 1,742 cubic yards. This is equivalent to 1.46 cubic feet for each million gallons of sewage pumped at Deer Island.

The material removed from the sewage at the screens of the South Metropolitan Sewerage Stations amounted to 4,652 cubic yards, equal to 3.57 cubic feet per million gallons of sewage delivered at the outfall works at Nut Island.

Studies of sewage flows in the Metropolitan sewers and siphons indicate that they are free from deposit.

Construction

North Metropolitan Relief Sewer

Surveys, borings, plans and specifications of the North Metropolitan Rel Sewer were completed during the past year. Contracts were let, and constructi work started on Sections 107, 108, 111, 112, 113, 114, 115A, and 115B. A descr tion of each section together with tabulation of the bids follows. It was discover that it was possible to effect certain economies in the lower sections and there make certain sums available for extending the limits of the construction providi enabling legislation could be effected. In pursuance of this, the Legislature duri 1936 enacted Chapter 352, which was approved June 16, 1936 authorizing t Metropolitan District Commission to extend the limits of the construction. Secti 115 was extended approximately 6,900 feet northerly, and Section 106 was add at the lower end. Section 115 was then divided into two sections, namely 11. and 115B.

North Metropolitan Relief Sewer, Section 107

This section is located in Medford and embraces construction of approximat 3,350 feet of re-inforced concrete sewer, 8½ feet high and 8½ feet wide, togetl with an overflow into the Mystic River just below Cradock Dam, a three-p 54 inch cast-iron siphon under the Mystic River between Main and Winthr Streets, and a structure for siphoning Meeting House Brook under the propos sewer. During the year it was deemed advisable to tunnel under Main Street, siphon under one important water line, and slightly depress a section under anotl water line. Work was started by the J. F. Fitzgerald Construction Compa March 2, 1936 and completed on or about November 9, 1936.

North Metropolitan Relief Sewer, Section 108

This work is located in Medford and includes construction of approximat 3,300 feet of re-inforced concrete sewer varying in size from 8½ feet high by 8 feet wide at the lower end to 7½ feet high by 7½ feet wide at the upper end. T section crosses the existing trunk line, and a special junction chamber is provid Most of the work involves open cut construction with wood sheeting. Howev at the junction with the existing sewer, it was deemed advisable to use some st sheeting to safeguard the existing sewer, and in Prescott Street a series of open and tunnel sections was used to avoid destruction of existing trees.

Bids were opened on this section on January 3, 1936. The contract was awarc by the Metropolitan District Commission on January 3, 1936, and accepted by t Federal Emergency Administration of Public Works on February 5, 1936. W was started by the C. & R. Construction Company on or about March 16, 19 and on December 31, 1936 was 86 per cent completed.

North Metropolitan Relief Sewer, Section 111

This work is located in Medford and includes the construction of approximat 5,615 feet of concrete sewer varying in size from 6 feet in diameter at the lower e to 5½ feet diameter at the upper end. This construction involves approximat 2,260 feet of compressed air tunneling under existing buildings and through d cuts.

Bids were opened on this section on February 17, 1936. The contract w awarded by the Metropolitan District Commission on March 26, 1936 and cepted by the Federal Emergency Administration of Public Works on April 1936.

Work was started by the V. Barletta Company on or about May 6, 1936, and December 31, 1936 was 58% completed.

North Metropolitan Relief Sewer, Section 112

This work is located in Medford, and Winchester and includes the construct of approximately 5,000 feet of concrete sewer, 5½ feet in diameter, of which appro mately 2,250 feet is tunnel construction in free air and the remainder open cut c struction. Much of the tunnel construction is through rock, and progress has b impeded particularly because of this.

Bids were opened on this section on February 17, 1936. The contract was awarc by the Metropolitan District Commission on February 27, 1936, and accepted the Federal Emergency Administration of Public Works on March 31, 1936. W

METROPOLITAN DISTRICT COMMISSION

SEWERAGE DIVISION

CANVASS OF BIDS - NORTH METROPOLITAN RELIEF SEWER - SECTION 107 - DECEMBER 5, 1935

BIDDERS AND ADDRESSES	1 EARTH EXCAVATION ABOVE GRADE 25,000 CU. YDS.	2 EARTH EXCAVATION BELOW GRADE 1,500 CU. YDS.	4 EARTH EXCAVATION OUTSIDE OF TRENCH 500 CU. YDS.	5 GRAVEL REFILL 1,500 CU. YDS.	7 ROCK EXCAVATION 100 CU. YDS.	8 CONCRETE 6,000 CU. YDS.	9 REINFORCING RODS 250 TONS	10 PIPE UNDER DRAIN 3,350 LIN. FT.	11 BRICK MASONRY 20 CU. YDS.	12 REVETMENT PAVEMENT 150 CU. YDS.	13 WOOD SHEETING 250 M.FT. B.M.	14 STEEL SHEETING 1,000 SQ. FT.	15 MINOR DRAINS 750 LIN. FT.	16 WOOD PILES 1,000 LIN. FT.	17 CAST IRON PIPE AND FITTINGS 215 TONS	18 MANHOLE FRAMES AND COVERS 8,000 LBS.	19 MISC. IRON 1,600 LBS.	20 COLD PATCH SURFACING 900 SQ. YDS.	22 SUPPORTING & MAINTAINING STRUCTURES, ETC.	23 GROUT 60 CU. YDS.	TOTALS
B. PERINI & SONS INC.	4.45	4.45	4.45	2.00	5.00	18.75	87.50	1.25	55.00	4.00	52.00	1.60	1.25	.50	100.00	.04	.06	1.25		15.00	345,001.00
FRAMINGHAM	111,250.00	6,675.00	2,225.00	3,000.00	500.00	112,500.00	21,875.00	8,375.00	1,100.00	600.00	13,000.00	1,600.00	937.50	500.00	21,500.00	320.00	96.00	1,125.00	41,110.00	900.00	
V. J. GRANDE CO.	4.90	3.25	2.50	3.00	3.00	15.00	65.00	1.50	40.00	6.00	40.00	.70	2.50	.50	90.00	.055 .035	.15	2.00		12.00	285,025.00
100 ACADEMY HILL RD. BOSTON	122,500.00	4,875.00	1,250.00	4,500.00	300.00	90,000.00	16,250.00	5,025.00	800.00	900.00	10,000.00	700.00	1,875.00	500.00	19,350.00	440.00 280.00	240.00	1,800.00	3,000.00	720.00	284,865.00
EDWARD M. MATZ	2.70	4.50	4.50	1.60	10.00	13.00	90.00	1.50	35.00	8.00	75.00	2.00	1.00	.40	75.00	.10	.10	1.00		15.00	258,110.00
25 ZAMORA ST. JAMAICA PLAIN	67,500.00	6,750.00	2,250.00	2,400.00	1,000.00	78,000.00	22,500.00	5,025.00	700.00	1,200.00	18,750.00	2,000.00	750.00	400.00	16,125.00	800.00	160.00	900.00	30,000.00	900.00	
J. H. FERGUSON CO.	3.16	3.00	3.00	2.00	6.00	11.00	120.00	1.00	35.00	6.00	40.00	1.50	1.50	1.25	85.00	.06	.15	2.00		20.00	230,420.00
289 CHAPMAN ST. PROVIDENCE, R.I.	79,000.00	4,500.00	1,500.00	3,000.00	600.00	66,000.00	30,000.00	3,350.00	700.00	900.00	10,000.00	1,500.00	1,125.00	1,250.00	18,275.00	480.00	240.00	1,800.00	5,000.00	1,200.00	
V. BARLETTA CO.	3.25	3.00	2.00	2.00	5.00	12.00	75.00	1.00	40.00	4.00	35.00	1.25	2.00	1.00	100.00	.10	.10	2.00		25.00	229,010.00
10 WHIPPLE AVE. ROSLINDALE	81,250.00	4,500.00	1,000.00	3,000.00	500.00	72,000.00	18,750.00	3,350.00	800.00	600.00	8,750.00	1,250.00	1,500.00	1,000.00	21,500.00	800.00	160.00	1,800.00	5,000.00	1,500.00	
P. DE CRISTOFARO	3.50	5.00	3.00	4.00	3.00	10.00	70.00	2.00	35.00	2.00	50.00	2.00	1.00	1.00	80.00	.06	.06	1.00		15.00	224,826.00
38 GLENDOWER RD. ROSLINDALE	87,500.00	7,500.00	1,500.00	6,000.00	300.00	60,000.00	17,500.00	6,700.00	700.00	300.00	12,500.00	2,000.00	750.00	1,000.00	17,200.00	480.00	96.00	900.00	1,000.00	900.00	
COLEMAN BROS. CORP.	2.70	5.00	5.00	2.00	5.00	13.00	70.00	.60	30.00	3.00	50.00	1.50	1.00	1.00	90.00	.05	.08	1.25		20.00	218,013.00
245 STATE ST. BOSTON	67,500.00	7,500.00	2,500.00	3,000.00	500.00	78,000.00	17,500.00	2,010.00	600.00	450.00	12,500.00	1,500.00	750.00	1,000.00	19,350.00	400.00	128.00	1,125.00	500.00	1,200.00	
A. BARUFFALOI CO.	2.50	2.00	1.50	1.50	3.00	12.00	60.00	2.00	40.00	4.00	80.00	.75	2.00	.60	80.00	.03	.05	.75		20.00	207,145.00
52 POWDER HOUSE BLVD. W. SOMERVILLE	62,500.00	3,000.00	750.00	2,250.00	300.00	72,000.00	15,000.00	6,700.00	800.00	600.00	20,000.00	750.00	1,500.00	600.00	17,200.00	240.00	80.00	675.00	1,000.00	1,200.00	
A. O. OADOARIO	2.50	2.00	3.00	2.00	5.00	11.00	70.00	4.00	50.00	5.00	40.00	.05	1.00	1.00	75.00	.03	.10	1.50		25.00	202,325.00
15 AGNES AVE. HYDE PARK	62,500.00	3,000.00	1,500.00	3,000.00	500.00	66,000.00	17,500.00	13,400.00	1,000.00	750.00	10,000.00	50.00	750.00	1,000.00	16,125.00	240.00	160.00	1,350.00	2,000.00	1,500.00	
C. & R. CONSTRUCTION CO.	1.90	2.00	1.50	1.00	3.00	13.00	55.00	4.00	30.00	5.00	30.00	.40	1.50	.20	100.00	.05	.10	1.00		10.00	197,835.00
67 HARRISON ST. ROSLINDALE	47,500.00	3,000.00	750.00	1,500.00	300.00	78,000.00	13,750.00	13,400.00	600.00	750.00	12,500.00	400.00	1,125.00	200.00	21,500.00	400.00	160.00	900.00	500.00	600.00	
J. F. FITZGERALD CONST. CO.	1.78	2.00	1.60	1.50	3.50	10.68	87.00	.56	22.00	5.00	20.00	.65	.75	.60	85.00	.06	.05	1.00		14.00	169,883.50
214 ESSEX ST. BOSTON	44,500.00	3,000.00	800.00	2,250.00	350.00	64,080.00	21,750.00	1,876.00	440.00	750.00	5,000.00	650.00	562.50	600.00	18,275.00	480.00	80.00	900.00	2,700.00	840.00	

DRAWN BY

CHECKED BY

CONTRACT AWARDED TO J. F. FITZGERALD CONST. CO.

THE COMMONWEALTH OF MASSACHUSETTS

METROPOLITAN DISTRICT COMMISSION

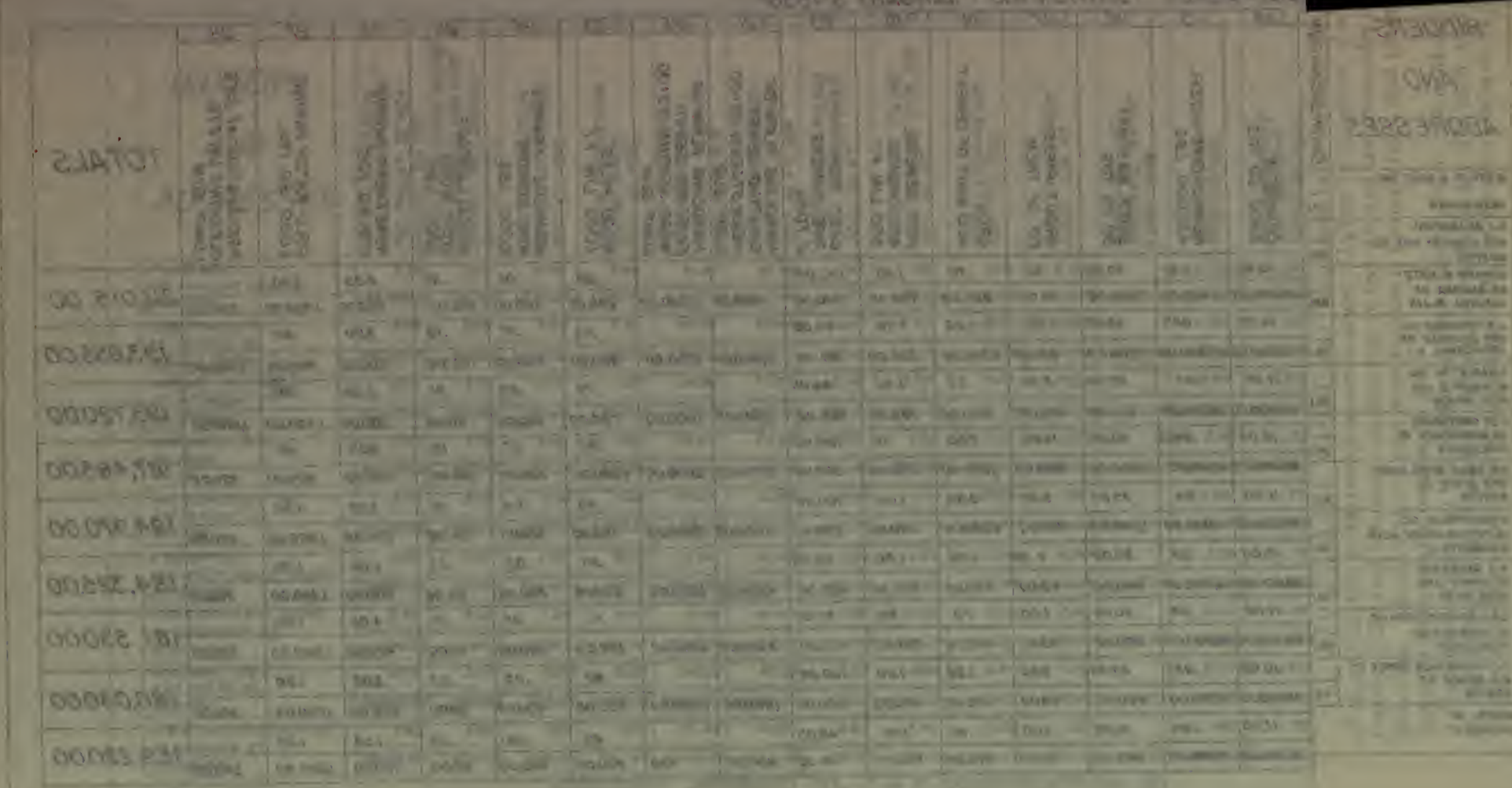
SEWERAGE DIVISION

CANVASS OF BIDS - NORTH METROPOLITAN RELIEF SEWER - SECTION 108 - JANUARY 3, 1936

BIDDERS AND ADDRESSES	1 EARTH EXCAVATION, ABOVE SEWER GRADE FOR RELIEF SEWER 24,000 CU YDS.	2 EARTH EXCAVATION, ABOVE SEWER GRADE, FOR PIPE SEWERS AND DRAINS 500 CU. YDS.	3 EARTH EXCAVATION OUTSIDE OF TRENCH 500 CU YDS.	4 EARTH EXCAVATION BELOW GRADE 500 CU YDS.	5 WOOD SHEETING AND LUMBER USED AND REMOVED 200 M.FT. B.M.	6 WOOD SHEETING AND LUMBER, USED AND LEFT IN PLACE 250 M. FT. B.M.	7 STEEL SHEET PILING USED AND REMOVED 200 SQ.FT.	8 STEEL SHEET PILING USED AND LEFT IN PLACE 100 SQ. FT.	9 ROCK EXCAVATION 100 CU. YDS.	10 PIPE UNDERDRAIN 3,300 LIN. FT.	11 HANDLING OF DRAINAGE WATER LUMP SUM	12 GRAVEL FILLING 500 CU. YDS.	13 SOIL DRESSING AND SEEDING 2000 SQ. YDS.	14 CONCRETE 5,500 CU YDS.	15 REINFORCING STEEL 450,000 LBS.	16 BRICK MASONRY 30 CU. YDS.	17 GROUT PIPES 20 OF THEM	18 GROUT 400 BAGS OF CEMENT	19 PIPE SEWERS AND DRAINS 500 LIN. FT.	20 CAST IRON PIPE SEWERS 2 TONS	21 HANDLING FLOW OF EXISTING SEWER NEAR STATION 18+00 LUMP SUM	22 HANDLING FLOW OF EXISTING SEWER NEAR STATION 33+00 LUMP SUM	23 WOOD PILES 1,000 LIN. FT.	24 MANHOLE FRAMES AND COVERS 8,000 LBS.	25 MISCELLANEOUS IRON WORK 1,000 LBS.	26 REVETMENT PAVING 100 SQ. YDS.	27 COLD PATCH PAVING 1,000 SQ. YDS.	28 PREPARATION AT SITE CLEANING UP, ETC. LUMP SUM	TOTALS
V. J. GRANOE 100 ACADEMY HILL RD. BRIGHTON	4.00	3.50	3.00	3.50	20.00	40.00	.45	.35	4.00	2.00		2.30	1.00	10.00	.037	30.00	.50	.70	1.50	100.00				.25	.05	.10	2.00	1.50		211,015.00
	96,000.00	1,750.00	1,500.00	1,750.00	4,000.00	10,000.00	90.00	35.00	400.00	6,600.00	4,000.00	1,150.00	2,000.00	55,000.00	16,650.00	900.00	10.00	280.00	750.00	200.00	3000.00	2,000.00	250.00	400.00	100.00	200.00	1,500.00	500.00	
EDWARD M. MATZ 25 ZAMORA ST. JAMAICA PLAIN	2.70	3.00	3.00	3.50	20.00	60.00	1.00	3.00	10.00	1.00		1.30	.30	12.00	.045	40.00	1.00	3.00	1.25	80.00				.40	.10	.10	3.00	.60		193,855.00
	64,800.00	1,500.00	1,500.00	1,730.00	4,000.00	15,000.00	200.00	300.00	1,000.00	3,300.00	3,000.00	650.00	1,000.00	66,000.00	20,230.00	1,200.00	20.00	1,200.00	625.00	160.00	2,000.00	1,000.00	400.00	800.00	100.00	500.00	600.00	1,000.00	
CHARLES STRUZZIERY 115 KITTREDGE ST. ROSLINDALE	3.00	2.00	1.50	3.00	20.00	35.00	3.00	2.80	6.00	3.00		2.00	1.00	11.00	.04	30.00	5.00	.70	1.50	80.00				.70	.05	.05	5.00	1.50		193,720.00
	72,000.00	1,000.00	750.00	1,500.00	4,000.00	8,750.00	600.00	280.00	300.00	9,900.00	500.00	1,000.00	2,000.00	60,500.00	18,000.00	900.00	100.00	280.00	750.00	160.00	5,000.00	1,000.00	700.00	400.00	50.00	500.00	1,500.00	1,000.00	
CENEDELLA & CO. MILFORD MASS.	2.50	3.00	3.00	3.00	26.00	26.00	1.50	2.80	6.00	1.50		2.00	.30	12.00	.0423	40.00	15.00	3.00	.70	150.00				1.30	.07	.15	5.00	.80		187,485.00
	60,000.00	1,500.00	1,500.00	1,500.00	5,200.00	6,500.00	300.00	250.00	600.00	4,950.00	6,600.00	1,000.00	600.00	66,000.00	19,125.00	1,200.00	300.00	1,200.00	350.00	300.00	2,700.00	2,000.00	1,300.00	560.00	150.00	500.00	800.00	500.00	
A. G. TOMASELLO CO. 250 STUART ST. BOSTON	2.50	2.50	2.50	3.00	20.00	40.00	2.00	3.00	10.00	1.00		1.00	.75	11.00	.04	35.00	3.00	3.00	1.00	100.00				.50	.04	.10	5.00	1.50		184,970.00
	60,000.00	1,230.00	1,250.00	2,500.00	4,000.00	10,000.00	400.00	300.00	1,000.00	3,300.00	10,000.00	500.00	1,500.00	60,500.00	18,000.00	1,030.00	100.00	1,200.00	300.00	200.00	3,000.00	1,000.00	300.00	320.00	100.00	500.00	1,500.00	300.00	
A. BARUFFALOI 1516 MYSTIC VALLEY PKWY W. MEDFORD	3.00	1.50	1.50	3.00	15.00	40.00	2.00	2.25	3.00	4.00		2.00	.10	10.00	.03	30.00	2.00	1.00	1.30	60.00				.20	.03	.05	2.00	1.50		184,325.00
	72,000.00	750.00	750.00	1,500.00	3,000.00	10,000.00	400.00	223.00	300.00	13,200.00	2,000.00	1,000.00	200.00	55,000.00	13,500.00	900.00	40.00	400.00	730.00	120.00	4,000.00	1,600.00	200.00	240.00	50.00	200.00	1,300.00	300.00	
P. DE CRISTOFARO CO. INC. 38 GLENDOWER RD. ROSLINDALE	2.50	5.00	1.50	2.00	10.00	45.00	1.00	3.00	6.00	3.50		3.00	1.00	11.00	.04	30.00	1.00	.70	1.50	50.00				.10	.07	.07	4.00	1.00		181,530.00
	60,000.00	2,500.00	750.00	1,000.00	2,000.00	11,250.00	200.00	500.00	600.00	11,550.00	300.00	1,500.00	2,000.00	60,500.00	18,000.00	900.00	20.00	280.00	750.00	100.00	2,500.00	1,500.00	100.00	360.00	70.00	400.00	1,000.00	500.00	
COLEMAN BROS. 243 STATE ST. BOSTON	2.73	3.00	3.00	3.00	50.00	50.00	2.00	2.00	5.00	1.00		2.00	1.00	10.00	.033	30.00	2.00	1.25	1.00	100.00				.60	.03	.03	2.00	1.00		180,040.00
	66,000.00	1,300.00	1,500.00	1,500.00	10,000.00	12,500.00	400.00	200.00	500.00	3,300.00	2,000.00	1,000.00	2,000.00	55,000.00	15,750.00	900.00	40.00	500.00	500.00	200.00	1,000.00	1,000.00	600.00	400.00	50.00	200.00	1,000.00	500.00	
C & R CONSTRUCTION CO. 75 BRADEEN ST. ROSLINDALE	3.00	3.00	1.00	1.00	10.00	35.00	2.90	2.90	10.00	.30		.80	.20	11.00	.028	30.00	2.00	.60	1.50	40.00				.20	.06	.06	1.00	1.00		169,220.00
	72,000.00	1,300.00	300.00	500.00	2,000.00	8,750.00	580.00	290.00	1,000.00	1,650.00	200.00	400.00	400.00	60,500.00	12,600.00	900.00	40.00	240.00	750.00	80.00	1,800.00	[illegible].00	200.00	480.00	60.00	100.00	1,000.00	500.00	

DRAWN BY J. P. Saunders
CHECKED BY John J. Brien

CONTRACT AWARDED TO - C. & R. CONSTRUCTION CO.



THE COMMONWEALTH OF MASSACHUSETTS

METROPOLITAN DISTRICT COMMISSION

SEWERAGE DIVISION

CANVASS OF BIDS - NORTH METROPOLITAN RELIEF SEWER - SECTION III - FEBRUARY 17, 1936

BIDDERS AND ADDRESSES	1 EARTH EXCAVATION AND BACKFILL IN TRENCH ABOVE SEWER GRADE FOR RELIEF SEWER 18,000 CU. YDS.	2 EARTH EXCAVATION AND BACKFILL IN TRENCH ABOVE SEWER GRADE FOR PIPES AND DRAINS 300 CU. YDS.	3 EARTH EXCAVATION AND BACKFILL OUTSIDE OF TRENCH 500 CU. YDS.	4 EARTH EXCAVATION BELOW GRADE 500 CU. YDS.	5 LUMBER AND SHEETING USED AND REMOVED 250 M. FT. B.M.	6 LUMBER AND SHEETING USED AND LEFT IN PLACE 500 M. FT. B.M.	7 STEEL SHEET PILING USED AND REMOVED 2,000 SQ. FT.	8 STEEL SHEET PILING USED AND LEFT IN PLACE 2,000 SQ. FT.	9 ROCK EXCAVATION IN TRENCH 400 CU. YDS.	10 PIPE UNDERDRAIN IN TRENCH 2,300 LIN. FT.	11 HANDLING OF DRAINAGE WATER IN TRENCH AND TUNNEL LUMP SUM	12 GRAVEL FILLING 800 CU. YDS.	13 SOIL DRESSING AND SEEDING 2,000 SQ. YDS.	14 CONCRETE IN OPEN CUT 4,000 CU. YDS.	15 REINFORCING STEEL 8,000 LBS.	16 BRICK MASONRY 100 CU. YDS.	17 GROUT PIPES 160 OF THEM	18 FURNISHING GROUT 6,000 BAGS OF CEMENT	18A GROUTING OPERATIONS 160 OF THEM	19 PIPE SEWERS AND DRAINS IN TRENCH 400 LIN. FT.	20 CAST IRON PIPE SEWERS, DRAINS AND SIPHONS 2,100 LIN. FT. 40 TONS	21 RELIEF SEWER IN TUNNEL (CONCRETE PIPE ARCH) DIAMETER 6'-0" 1,200 LIN. FT.	22 RELIEF SEWER IN TUNNEL (BRICK ARCH) DIAMETER 6'-6" 1,200 LIN. FT.	23 RELIEF SEWER IN TUNNEL (CONCRETE PIPE ARCH) DIAMETER 5'-6" 2,100 LIN. FT.	24 RELIEF SEWER IN TUNNEL (BRICK ARCH) DIAMETER 6'-0" 2,100 LIN. FT.	25 FURNISHING AND SETTING TUNNEL LINER PLATES OF ADDITIONAL WEIGHT 250,000 LBS.	25A FURNISHING AND SETTING STEEL LINER PLATES IN SHAFTS 50,000 LBS	26 ADDITIONAL FOR PRESSURE PRESSURE OF LESS THAN 18 LB. PER SQ. IN. 1,600 LIN. FT.	27 ADDITIONAL FOR PRESSURE PRESSURE OF 18 LB. PER SQ. IN. OR MORE 700 LIN. FT.	28 ADDITIONAL FOR INSTALLATION AND CONNECTING IN TUNNEL UNDER AIR PRESSURE 500 LIN. FT.	29 FURNISHING AND INSTALLING AIR LOCKS AND EQUIPMENT 3 SHAFTS	30 TUNNEL SHAFTS LUMP SUM	31 ROCK EXCAVATION IN TUNNEL 50 CU. YDS.	32 REMOVAL OF EXISTING BUILDING LUMP SUM	33 WOOD PILES 500 LIN. FT.	34 MANHOLE FRAMES AND COVERS 9,000 LBS.	35 MISCELLANEOUS IRON WORK 1,000 LBS.	36 COLD PATCH PAVING 700 SQ. YDS.	37 PREPARATION AT SITE CLEANING UP, ETC. LUMP SUM	TOTALS ALL ITEMS EXCEPT ITEM 22 AND ITEM 24	TOTALS ALL ITEMS EXCEPT ITEM 21 AND ITEM 23
J.H.FERGUSON CO. 289 CHAPMAN ST. PROVIDENCE, R.I.	6.25	8.25	5.00	4.00	20.00	55.00	1.00	1.60	5.00	1.00		2.50	1.20	12.60	.06	40.00	2.00	1.00	25.00	4.00	140.00	108.00	141.00	102.00	129.00	.0365	.06	17.00	17.00	5.00	16,000		20.00		2.00	.04	.20	2.00			
	112,500.00	1,875.00	1,500.00	2,000.00	6,000.00	17,500.00	2,000.00	5,200.00	2,000.00	2,500.00	5,000.00	2,000.00	2,400.00	50,000.00	480.00	4,000.00	520.00	6,000.00	4,000.00	1,600.00	5,600.00	129,600.00	169,200.00	214,200.00	270,900.00	9,125.00	5,000.00	27,200.00	11,900.00	1,500.00	48,000.00	5,000.00	1,000.00	2,000.00	1,000.00	560.00	200.00	1,400.00	500.00	687,260.00	783,560.00
B PERIHI & SONS INC.	2.926	1.57	1.57	1.37	71.67	86.91	1.55	1.19	1.10	1.16		1.10	.53	11.45	.05	26.92	1.47	1.66	51.78	1.87	95.00	89.75	96.15	80.41	87.57	.041	.12	40.29	1.00	5.50	9,357.00		6.81		.57	.05	.09	1.12			
FRAMINGHAM	52,568.00	411.00	685.00	685.00	17,917.50	45,455.00	2,680.00	2,580.00	440.00	2,668.00	28,098.40	880.00	1,060.00	45,800.00	400.00	2,692.00	255.20	9,960.00	8,284.80	748.00	57,200.00	107,676.00	115,556.00	168,861.00	185,477.00	10,250.00	6,000.00	64,464.00	700.00	1,650.00	28,071.00	4,544.10	540.50	1,100.00	285.00	450.00	90.00	784.00	2,200.00	623,313.50	645,609.50
COLEMAN BROS. CORP. 245 STATE ST. BOSTON	5.00	3.00	5.00	5.00	50.00	50.00	2.00	2.00	10.00	1.00		2.00	.50	10.00	.05	50.00	2.00	1.00	23.00	1.00	100.00	105.00	105.00	95.00	95.00	.05	.05	20.00	30.00	10.00	2,500.00		25.00		1.00	.06	.10	1.00			
	54,000.00	900.00	1,500.00	2,500.00	12,500.00	25,000.00	4,000.00	4,000.00	4,000.00	2,500.00	26,000.00	1,600.00	1,000.00	40,000.00	400.00	3,000.00	320.00	6,000.00	4,000.00	400.00	4,000.00	126,000.00	126,000.00	199,500.00	199,500.00	12,500.00	2,500.00	52,000.00	21,000.00	5,000.00	7,500.00	2,500.00	1,250.00	2,500.00	500.00	540.00	100.00	700.00	1,000.00	611,510.00	611,510.00
C. B R. CONSTRUCTION CO. 75 BRADEEN ST. ROSLINDALE	4.25	5.50	1.00	1.00	20.00	20.00	1.50	2.50	5.00	5.00		.50	.20	15.00	.04	50.00	1.00	.60	20.00	1.00	60.00	142.00	160.00	80.00	100.00	.04	.08	1.00	1.00	2.00	200.00	100.00	20.00		.20	.05	.05	1.00			
	78,500.00	1,050.00	500.00	500.00	5,000.00	10,000.00	5,000.00	5,000.00	1,200.00	11,500.00	500.00	240.00	400.00	52,000.00	520.00	5,000.00	160.00	5,600.00	5,200.00	400.00	2,400.00	170,400.00	192,000.00	168,000.00	210,000.00	10,000.00	4,000.00	1,600.00	700.00	1,000.00	600.00	100.00	1,000.00	9,100.00	100.00	450.00	50.00	700.00	1,000.00	549,270.00	612,870.00
V. BARLETTA CO. 10 WHIPPLE AVE ROSLINDALE	5.50	5.00	2.00	5.50	20.00	25.00	.50	.50	4.00	1.50		5.00	1.00	15.25	.05	40.00	5.00	.70	15.00	2.00	140.00	85.00	84.00	80.00	79.00	.05	.045	12.00	12.00	5.00	1,500.00		20.00	1,000.00	.60	.10	.15	1.00			
	65,000.00	900.00	1,000.00	1,750.00	5,000.00	12,500.00	1,000.00	1,000.00	1,600.00	5,450.00	7,600.00	2,400.00	2,000.00	53,000.00	400.00	4,000.00	480.00	4,200.00	2,400.00	800.00	5,600.00	102,000.00	100,800.00	168,000.00	165,900.00	7,500.00	2,250.00	19,200.00	8,400.00	2,500.00	4,500.00	6,000.00	1,000.00	1,000.00	500.00	900.00	150.00	700.00	4,500.00	502,880.00	499,580.00

DRAWN BY KJS

CHECKED BY R.W. Hill, R.C. Chase

CONTRACT AWARDED TO— V. BARLETTA CO.

I certify this to be a true and accurate summary of bids

Frank E. Jones

Chief Engineer of Sewerage Division

| | | |

THE COMMONWEALTH OF MASSACHUSETTS

METROPOLITAN DISTRICT COMMISSION

SEWERAGE DIVISION

CANVASS OF BIDS - NORTH METROPOLITAN RELIEF SEWER - SECTION 112 - FEBRUARY 17, 1936

BIDDERS AND ADDRESSES	1 EARTH EXCAVATION AND BACKFILLING TRENCH ABOVE SEWER GRADE FOR RELIEF SEWER 17,000 CU YDS	2 EARTH EXCAVATION AND BACKFILLING ABOVE SEWER GRADE FOR PIPES AND DRAINS 200 CU YDS.	3 EARTH EXCAVATION AND BACKFILL OUTSIDE OF TRENCH 200 CU YDS	4 EARTH EXCAVATION BELOW GRADE 400 CU YDS.	5 LUMBER AND SHEETING USED AND REMOVED 300 M FT B.M.	6 LUMBER AND SHEETING USED AND LEFT IN PLACE 300 M FT B.M.	7 STEEL SHEET PILING USED AND REMOVED 1,000 SQ. FT.	8 STEEL SHEET PILING USED AND LEFT IN PLACE 1,000 SQ. FT.	9 ROCK EXCAVATION IN TRENCH 1,000 CU YDS	10 PIPE UNDERDRAIN IN TRENCH 2,600 LIN. FT.	11 HANDLING OF DRAINAGE WATER IN TRENCH AND TUNNEL LUMP SUM	12 GRAVEL FILLING 600 CU YDS	13 SOIL DRESSING AND SEEDING 1,000 SQ YDS.	14 CONCRETE IN OPEN CUT 3,500 CU YDS.	15 REINFORCING STEEL 2,000 LBS.	16 BRICK MASONRY 100 CU YDS.	17 GROUT PIPES 120 OF THEM	18 FURNISHING GROUT 5,000 BAGS OF CEMENT	18A GROUTING OPERATIONS 120 OF THEM	19 PIPE SEWERS AND DRAINS IN TRENCH 200 LIN FT.	20 CAST IRON PIPE SEWERS, DRAINS AND SIPHONS IN TRENCH 20 TONS	21 RELIEF SEWER IN TUNNEL (CONCRETE PIPE ARCH) DIAMETER 5'-6" 2,350 LIN. FT.	22 RELIEF SEWER IN TUNNEL (BRICK ARCH) DIAMETER 6'-0" 2,350 LIN. FT.	23 FURNISHING AND SETTING TUNNEL LINER PLATES OF ADDITIONAL WEIGHT 200,000 LBS.	23A FURNISHING AND SETTING LINER PLATES IN SHAFTS 50,000 LBS	24 ADDITIONAL FOR PRESSURE TUNNEL UNDER AIR UNDER PRESSURE OF LESS THAN 18 LB PER SQ IN. 1,200 LIN FT.	25 ADDITIONAL FOR PRESSURE TUNNEL UNDER AIR UNDER PRESSURE OF 18 LB PER SQ IN. OR MORE 300 LIN FT.	26 ADDITIONAL FOR INSTALLING AND MAINTAINING IN TUNNEL UNDER AIR PRESSURE 300 LIN FT.	27 FURNISHING, INSTALLING AND MAINTAINING AIR LOCKS AND EQUIPMENT 3 SHAFTS	28 TUNNEL SHAFTS LUMP SUM	29 ROCK EXCAVATION IN TUNNEL 200 CU YDS	30 FURNISHING AND LAYING 24" V.C. PIPE 400 LIN FT.	31 WOOD PILES 400 LIN FT.	32 MANHOLE FRAMES AND COVERS 7,000 LBS	33 MISCELLANEOUS IRON WORK 1,000 LBS	34 COLD PATCH PAVING 200 SQ YDS.	35 PREPARATION AT SITE CLEANING UP, ETC. LUMP SUM	TOTALS ALL ITEMS EXCEPT ITEM 22	TOTALS ALL ITEMS EXCEPT ITEM 21
J. H. FERGUSON CO. 289 CHAPMAN ST PROVIDENCE R.I.	4.60	4.60	3.00	4.00	20.00	30.00	1.50	2.00	8.00	1.00		2.50	1.20	11.50	.06	40.00	2.00	1.00	25.00	3.00	14.00	105.25	129.00	.0365	.06	10.00	10.00	3.00	6,000.00		20.00	8.00	2.00	.04	.10	2.00		482,447.50	538,260.00
	78,200.00	920.00	600.00	1,600.00	6,000.00	9,000.00	1,500.00	2,000.00	8000.00	2,600.00	5,000.00	1,500.00	1,200.00	40,250.00	120.00	4,000.00	240.00	5,000.00	3,000.00	600.00	2,800.00	247,337.50	303,150.00	7,300.00	3,000.00	12,000.00	5,000.00	90.00	18,000.00	5,000.00	4,000.00	3,200.00	800.00	280.00	100.00	400.00	1,000.00		
COLEMAN BROS. INC. 245 STATE ST. BOSTON	3.00	3.00	3.00	5.00	50.00	50.00	2.00	2.00	10.00	1.00		2.00	.50	10.00	.05	30.00	2.00	1.00	25.00	1.00	100.00	9.500	9.500	.05	.05	15.00	25.00	5.00	2,500.00		25.00	4.00	1.00	.06	.10	1.00		457,510.00	457,510.00
	51,000.00	600.00	600.00	2,000.00	15,000.00	15,000.00	2,000.00	2,000.00	10,000.00	2,600.00	20,000.00	1,200.00	500.00	35,000.00	100.00	3,000.00	240.00	5,000.00	3,000.00	200.00	2,000.00	223,250.00	223,250.00	10,000.00	2,500.00	18,000.00	12,500.00	1,500.00	7,500.00	2,500.00	5,000.00	1,600.00	400.00	420.00	100.00	200.00	1,000.00		
B PERINI & SONS INC.	4.25	1.37	1.37	1.37	36.00	36.00	1.33	1.20	3.85	1.38		1.10	.53	12.80	.04	26.92	1.48	.77	22.55	1.90	94.00	82.63	89.65	.045	.115	17.30	1.10	3.30	3,677.00		30.80	2.20	.57	.05	.09	1.12		437,017.10	453,514.10
FRAMINGHAM	72,250.00	274.00	274.00	548.00	10,800.00	10,800.00	1,330.00	1,200.00	3,850.00	3,588.00	12,254.00	660.00	530.00	44,800.00	80.00	2,692.00	177.60	3,850.00	2,706.00	380.00	1,880.00	194,180.50	210,677.50	9,000.00	5,750.00	20,760.00	550.00	990.00	11,031.00	6,700.00	6,160.00	880.00	228.00	350.00	90.00	224.00	5,200.00		
CENEDELLA & CO.	5.05	5.00	5.00	5.00	1.00	1.00	1.00	1.00	.50	.75		2.00	.40	11.50	.07	40.00	3.00	1.50	20.00	4.00	125.00	102.50	110.00	.01	.06	.50	.50	1.00	500.00		25.00	10.00	1.20	.10	.20	2.00		421,255.00	438,880.00
MILFORD	85,850.00	1,000.00	1,000.00	2,000.00	300.00	300.00	1,000.00	1,000.00	500.00	1,950.00	3,000.00	1,200.00	400.00	40,250.00	1.40	4,000.00	360.00	7,500.00	2,400.00	800.00	2,500.00	240,875.00	258,500.00	2,000.00	3,000.00	600.00	250.00	300.00	1,500.00	4,000.00	5,000.00	4,000.00	480.00	700.00	200.00	400.00	500.00		
P. DE CRISTOFARO 38 GLENDOWER RD. ROSLINDALE	1.00	2.00	2.00	2.00	15.00	40.00	1.00	1.00	3.00	2.00		2.00	1.00	11.50	.03	30.00	5.00	.65	5.00	8.20	100.00	93.00	115.00	.0425	.045	8.00	3.00	1.00	4,000.00		30.00	5.00	.50	.04	.07	.75		403,370.00	455,070.00
	51,000.00	400.00	400.00	800.00	4,500.00	12,000.00	1,000.00	1,000.00	3,000.00	5,200.00	2,000.00	1,200.00	1,000.00	40,250.00	60.00	3,000.00	600.00	3,250.00	600.00	1,000.00	2,000.00	218,550.00	270,250.00	8,500.00	2,250.00	9,600.00	1,500.00	300.00	12,000.00	6,000.00	6,000.00	2,000.00	200.00	490.00	70.00	150.00	1,500.00		
T STUART & SONS CO. 70 PHILLIPS ST WATERTOWN	2.50	3.50	3.00	3.00	30.00	70.00	.75	1.50	3.50	1.00		1.50	1.00	12.00	.04	30.00	10.00	1.50	20.00	1.50	120.00	83.00	95.00	.01	.10	5.00	5.00	5.00	1,000.00		15.00	5.00	.50	.06	.06	1.00		379,960.00	408,160.00
	42,500.00	400.00	600.00	1,200.00	9,000.00	21,000.00	750.00	1,000.00	3,500.00	2,600.00	5,000.00	900.00	1,000.00	42,200.00	80.00	3,000.00	1,800.00	7,500.00	2,400.00	300.00	2,400.00	195,050.00	223,250.00	2,000.00	5,000.00	6,000.00	2,500.00	1,500.00	3,000.00	10,000.00	3,000.00	2,000.00	200.00	420.00	60.00	200.00	500.00		
V. BARLETTA CO. 10 WHIPPLE AVE ROSLINDALE	3.50	3.00	2.00	3.00	15.00	25.00	.30	.50	6.00	1.00		2.00	.90	13.25	.05	35.00	3.00	.70	15.00	1.00	140.00	76.00	75.00	.03	.045	5.00	5.00	5.00	1,200.00		20.00	3.00	.60	.10	.15	1.00		362,975.00	360,625.00
	59,500.00	600.00	400.00	1,200.00	4,500.00	7,500.00	500.00	500.00	6,000.00	2,600.00	5,000.00	1,200.00	900.00	46,375.00	100.00	3,500.00	360.00	3,500.00	1,800.00	200.00	2,800.00	178,500.00	176,250.00	6,000.00	2,250.00	6,000.00	2,500.00	1,500.00	3,600.00	3,000.00	4,000.00	1,200.00	240.00	700.00	150.00	200.00	4,000.00		
C. & R. CONSTRUCTION CO. 75 BRADEEN ST. ROSLINDALE	1.00	3.00	1.00	1.00	5.00	20.00	1.50	2.50	5.00	2.00		.50	.75	13.00	.08	40.00	1.00	.80	20.00	1.00	60.00	80.00	95.00	.035	.08	.00	1.00	2.00	100.00		20.00	3.00	.20	.04	.04	1.00		358,800.00	394,050.00
	68,000.00	700.00	200.00	400.00	1,500.00	6,000.00	1,500.00	2,500.00	5,000.00	5,200.00	100.00	300.00	200.00	45,500.00	80.00	4,000.00	120.00	3,000.00	2,400.00	200.00	1,200.00	188,000.00	223,250.00	7,000.00	4,000.00	1,200.00	500.00	600.00	300.00	1,500.00	4,000.00	2,000.00	80.00	280.00	40.00	200.00	1,000.00		

DRAWN BY [signature]

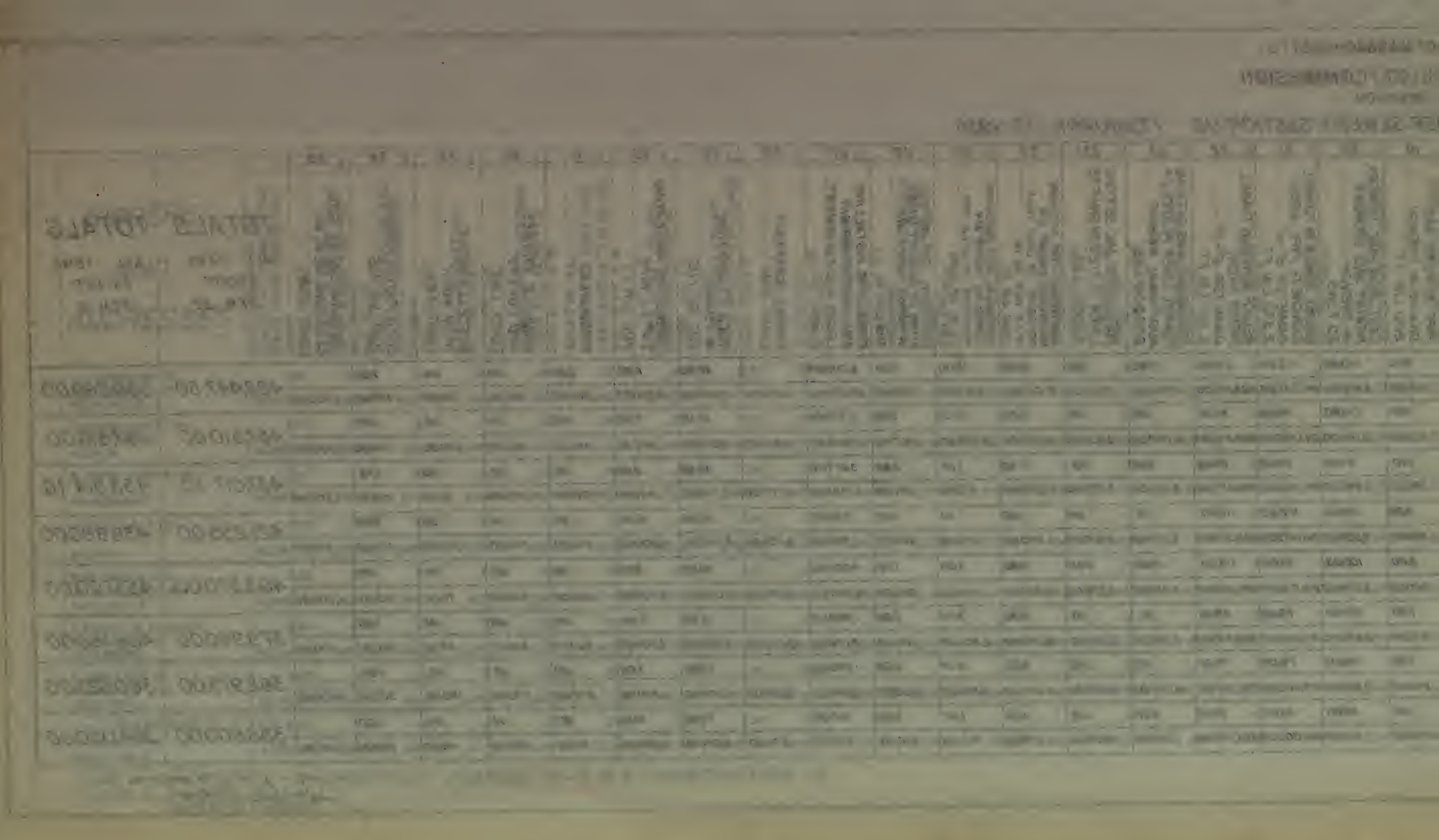
CHECKED BY [signature]

CONTRACT AWARDED TO - C. & R. CONSTRUCTION CO.

I certify this to be a true and accurate summary of bids

[signature]

Chief Engineer of Sewerage Division



THE COMMONWEALTH OF MASSACHUSETTS

METROPOLITAN DISTRICT COMMISSION

SEWERAGE DIVISION

CANVASS OF BIDS - NORTH METROPOLITAN RELIEF SEWER - SECTION 113 - FEBRUARY 19, 1936

BIDDERS AND ADDRESSES	1 EARTH EXCAVATION AND BACKFILL IN TRENCH ABOVE SEWER GRADE FOR RELIEF SEWER 16,000 CU. YDS.	2 EARTH EXCAVATION AND BACKFILL IN TRENCH ABOVE SEWER GRADE FOR PIPES AND DRAINS 1,500 CU. YDS.	3 EARTH EXCAVATION AND BACKFILL OUTSIDE OF TRENCH 5,000 CU. YDS.	4 EARTH EXCAVATION BELOW GRADE 700 CU. YDS.	5 LUMBER AND SHEETING USED AND REMOVED 100 M. FT. B.M.	6 LUMBER AND SHEETING USED AND LEFT IN PLACE 300 M. FT. B.M.	7 STEEL SHEET PILING USED AND REMOVED 1,000 SQ. FT.	8 STEEL SHEET PILING USED AND LEFT IN PLACE 1,000 SQ. FT.	9 ROCK EXCAVATION IN TRENCH 600 CU. YDS.	10 PIPE UNDERDRAIN IN TRENCH 4,200 LIN. FT.	11 HANDLING OF DRAINAGE WATER LUMP SUM	12 GRAVEL FILLING 1,000 CU. YDS.	13 SOIL DRESSING AND SEEDING 2,000 SQ. YDS.	14 CONCRETE IN TRENCH 6,000 CU. YDS.	15 REINFORCING STEEL 6,000 LBS.	16 BRICK MASONRY 30 CU. YDS.	17 GROUT PIPES 10 OF THEM	18 FURNISHING GROUT 200 BAGS OF CEMENT	18A GROUTING OPERATIONS 10 OF THEM	19 PIPE SEWERS AND DRAINS IN TRENCH 500 LIN. FT.	20 CAST IRON PIPE SEWERS DRAINS AND SIPHONS IN TRENCH 60 TONS	20A RELIEF SEWER IN TUNNEL 140 LIN. FT.	21 WOOD PILES 300 LIN. FT.	22 MANHOLE FRAMES AND COVERS 9,000 LBS.	23 MISCELLANEOUS IRON WORK 1,000 LBS.	24 COLD PATCH PAVING 1,500 SQ. YDS.	25 REVETMENT PAVING 1,000 SQ. YDS.	26 PREPARATION AT SITE CLEANING UP ETC. LUMP SUM	TOTALS
EDWARD M. MATZ 25 ZAMORA ST. JAMAICA PLAIN	2.50	2.75	2.75	4.00	40.00	60.00	1.50	3.00	12.00	.80		1.25	.50	12.00	.045	40.00	1.00	3.00	10.00	2.00	80.00	60.00	1.00	.10	.10	.80	5.00		205,865.00
	40,000.00	4,125.00	13,750.00	2,800.00	4,000.00	18,000.00	1,500.00	3,000.00	7,200.00	3,360.00	4,000.00	1,250.00	1,000.00	72,000.00	270.00	1,200.00	10.00	600.00	100.00	1,000.00	4,800.00	8,400.00	300.00	900.00	100.00	1,200.00	5,000.00	6,000.00	
B. PERINI & SONS INC.	3.00	1.45	1.35	1.35	5.00	10.00	.34	.34	1.40	1.25		1.15	.55	12.00	.65	30.00	1.80	.85	45.00	2.30	104.00	67.00	.60	.05	.10	1.20	2.00		198,816.00
FRAMINGHAM	48,000.00	2,175.00	6,750.00	945.00	500.00	3,000.00	340.00	340.00	840.00	5,250.00	31,000.00	1,150.00	1,100.00	72,000.00	300.00	900.00	16.00	160.00	450.00	1,150.00	6,240.00	9,380.00	180.00	450.00	100.00	1,800.00	2,000.00	2,300.00	
COLEMAN BROS. INC. 245 STATE ST. BOSTON	5.00	2.00	.50	4.00	10.00	10.00	1.00	1.00	5.00	1.00		.50	.50	10.00	.65	30.00	5.00	1.00	20.00	1.30	100.00	80.00	1.40	.05	.10	.50	2.00		194,550.00
	80,000.00	3,000.00	5,000.00	2,800.00	1,000.00	3,000.00	1,000.00	1,000.00	3,000.00	4,200.00	5,000.00	500.00	1,000.00	60,000.00	300.00	900.00	50.00	200.00	200.00	500.00	6,000.00	11,200.00	150.00	450.00	100.00	1,500.00	2,000.00	50.00	
P. DE CRISTOFARO 38 GLENDOWER RD. ROSLINDALE	2.60	2.00	1.50	2.15	5.00	50.00	2.00	3.00	2.00	1.25		1.25	1.00	12.00	.06	40.00	1.00	1.00	20.00	5.40	80.00	50.00	20.00	.06	.03	.50	1.00		193,695.00
	41,600.00	3,000.00	7,500.00	1,505.00	500.00	15,000.00	2,000.00	3,000.00	1,200.00	17,850.00	100.00	1,250.00	2,000.00	72,000.00	360.00	1,200.00	10.00	200.00	200.00	2,700.00	4,800.00	7,000.00	6,000.00	540.00	30.00	750.00	1,000.00	400.00	
C. & R. CONSTRUCTION CO. 75 BRADEEN ST. ROSLINDALE	5.30	1.00	.50	1.00	10.00	30.00	3.00	1.50	1.00	3.00		.50	.20	11.00	.04	30.00	.55	.55	1.00	1.00	100.00	80.00	.20	.05	.05	1.00	2.00		172,435.00
	48,000.00	1,500.00	2,500.00	700.00	1,000.00	9,000.00	3,000.00	1,500.00	600.00	12,600.00	100.00	500.00	900.00	66,000.00	240.00	900.00	5.00	120.00	10.00	500.00	6,000.00	11,200.00	60.00	450.00	50.00	1,500.00	2,000.00	2,000.00	
ZOPPO & CIVITARESE 480 METROPOLITAN AVE. HYDE PARK	2.50	2.50	1.75	2.50	20.00	35.00	.50	.50	1.00	1.00		1.50	.25	11.50	.05	35.00	2.00	.60	2.00	.50	170.00	57.00	.25	.06	.06	1.00	2.00		169,165.00
	40,000.00	3,750.00	8,750.00	1,750.00	2,000.00	10,500.00	500.00	500.00	600.00	4,200.00	1,000.00	1,500.00	500.00	69,000.00	300.00	1,050.00	20.00	120.00	20.00	250.00	10,200.00	7,980.00	75.00	540.00	60.00	1,500.00	2,000.00	500.00	
A. BARUFFALDI CO. 52 POWDER HOUSE BLVD. SOMERVILLE	2.00	1.50	.50	1.00	10.00	60.00	.90	.90	2.00	4.00		.80	1.00	8.00	.03	30.00	2.00	.60	10.00	1.50	75.00	140.00	.20	.05	.05	1.00	1.50		157,480.00
	32,000.00	2,250.00	2,500.00	700.00	1,000.00	18,000.00	900.00	900.00	1,200.00	16,800.00	500.00	800.00	2,000.00	48,000.00	180.00	900.00	20.00	120.00	100.00	750.00	4,500.00	19,600.00	60.00	450.00	50.00	1,500.00	1,500.00	200.00	

DRAWN BY F. L. Saunders

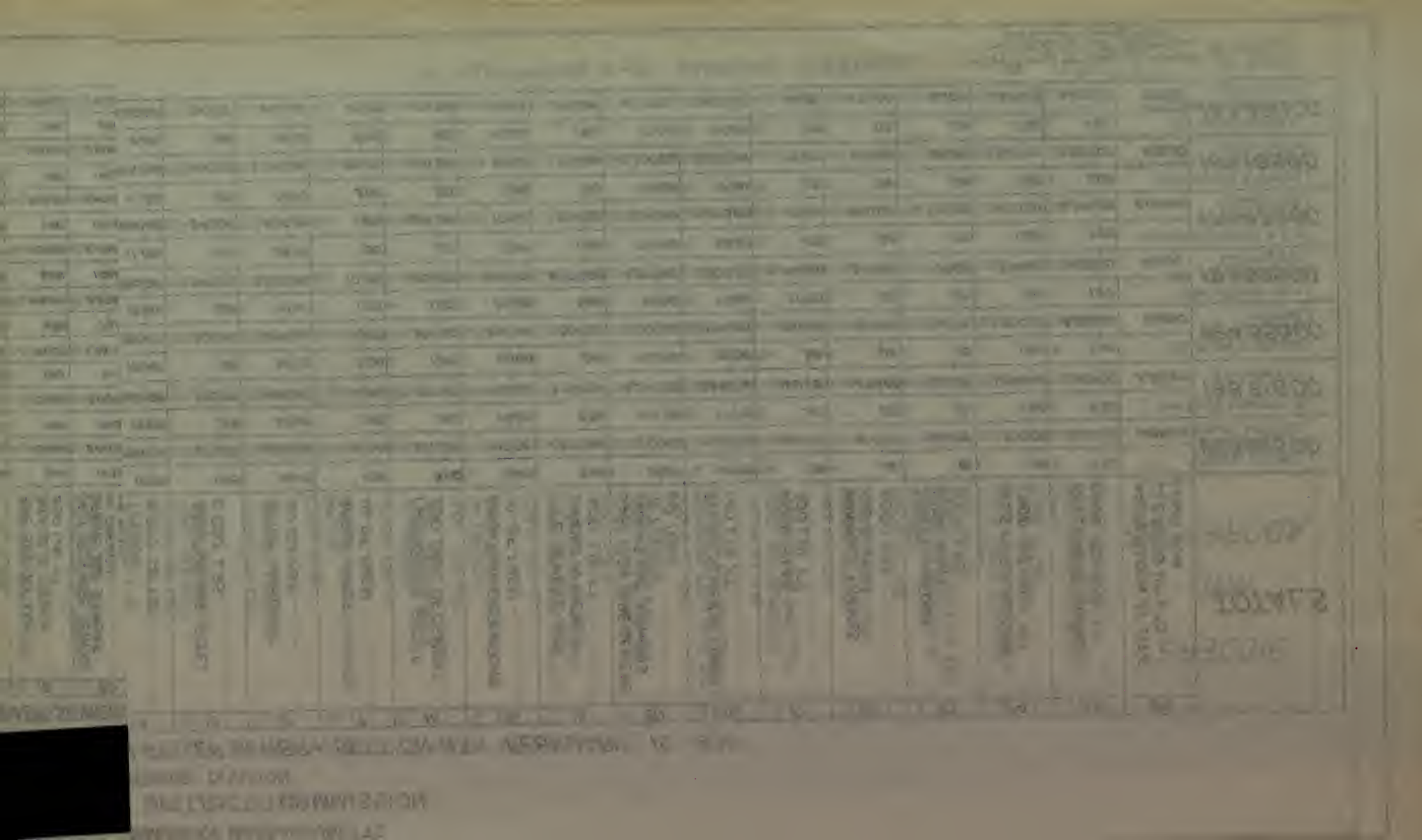
CHECKED BY John J. O'Brien

CONTRACT AWARDED TO - A. BARUFFALDI CO.

I certify this to be a true and accurate summary of bids

Joseph P. Oliver

Chief Engineer of Sewerage Division



THE COMMONWEALTH OF MASSACHUSETTS

METROPOLITAN DISTRICT COMMISSION

SEWERAGE DIVISION

CANVASS OF BIDS - NORTH METROPOLITAN RELIEF SEWER - SECTION 114 - FEBRUARY 27, 1936

BIDDERS AND ADDRESSES	1 EARTH EXCAVATION AND BACKFILL IN TRENCH ABOVE SEWER GRADE FOR RELIEF SEWER 22,000 CU YDS.	2 EARTH EXCAVATION AND BACKFILL IN TRENCH ABOVE SEWER GRADE FOR PIPES AND DRAINS 300 CU YDS.	3 EARTH EXCAVATION AND BACKFILL OUTSIDE OF TRENCH 300 CU YDS.	4 EARTH EXCAVATION BELOW GRADE 200 CU YDS.	5 LUMBER AND SHEETING USED AND REMOVED 300 M FT B.M.	6 LUMBER AND SHEETING USED AND LEFT IN PLACE 400 M FT B.M.	7 STEEL SHEET PILING USED AND REMOVED 1,000 SQ FT	8 STEEL SHEET PILING USED AND LEFT IN PLACE 2000 SQ FT	9 ROCK EXCAVATION IN TRENCH 700 CU YDS.	10 PIPE UNDERDRAIN IN TRENCH 6,200 LIN FT	11 HANDLING OF DRAINAGE WATER LUMP SUM	12 GRAVEL FILLING 500 CU YDS.	13 SOIL DRESSING AND SEEDING 2,000 SQ YDS.	14 CONCRETE IN TRENCH 7000 CU YDS	15 REINFORCING STEEL 2,000 LBS.	16 BRICK MASONRY 60 CU YDS.	17 GROUT PIPES 10 OF THEM	18 FURNISHING GROUT 200 BAGS OF CEMENT	18A GROUTING OPERATIONS 10 OF THEM	19 PIPE SEWERS AND DRAINS IN TRENCH 100 LIN FT	20 CAST IRON PIPE SEWERS DRAINS AND SIPHONS IN TRENCH 2 TONS	21 WOOD PILES 300 LIN FT	22 MANHOLE FRAMES AND COVERS 15,000 LBS.	23 MISCELLANEOUS IRON WORK 1,000 LBS.	24 COLD PATCH PAVING 100 SQ YDS.	25 REVETMENT PAVING 100 SQ YDS.	26 PREPARATION AT SITE CLEANING UP ETC. LUMP SUM	TOTALS
ZEPPO & CIVITARESE 480 METROPOLITAN AVE. HYDE PARK	4.50 99,000.00	1.00 300.00	1.00 300.00	3.00 600.00	20.00 6,000.00	35.00 14,000.00	.40 400.00	.40 800.00	1.00 700.00	4.00 24,800.00	 15,000.00	4.00 2,000.00	.20 400.00	13.00 91,000.00	.05 100.00	35.00 2,100.00	10.00 100.00	.60 120.00	10.00 100.00	1.00 100.00	60.00 120.00	.25 75.00	.06 900.00	.06 60.00	1.00 100.00	2.00 200.00	 500.00	259,875.00
C. B R. CONSTRUCTION CO. 75 BRADEEN ST. ROSLINDALE	4.25 93,500.00	.50 150.00	.50 150.00	.50 100.00	5.00 1,500.00	5.00 2,000.00	3.00 3,000.00	3.00 6,000.00	1.00 700.00	4.00 24,800.00	 11,500.00	.30 150.00	.50 1,000.00	10.00 70,000.00	.10 200.00	30.00 1,800.00	1.00 10.00	.60 120.00	10.00 100.00	1.00 100.00	50.00 100.00	.20 60.00	.05 750.00	.05 50.00	1.00 100.00	1.00 100.00	 3,500.00	221,540.00
A.R. DOYLE, INC. 44 PERKINS ST. JAMAICA PLAIN	3.00 66,000.00	1.00 300.00	1.00 300.00	1.00 200.00	5.00 1,500.00	10.00 4,000.00	2.50 2,500.00	2.50 5,000.00	1.00 700.00	1.50 9,300.00	 18,000.00	.50 250.00	.50 1,000.00	12.00 84,000.00	.04 80.00	30.00 1,800.00	1.00 10.00	1.00 200.00	5.00 50.00	1.25 125.00	40.00 80.00	.50 150.00	.04 600.00	.04 40.00	1.50 150.00	.50 50.00	 3,000.00	199,385.00
COLEMAN BROS. INC. 245 STATE ST. BOSTON	4.50 99,000.00	2.00 600.00	2.00 600.00	4.00 800.00	10.00 3,000.00	10.00 4,000.00	1.00 1,000.00	1.00 2,000.00	5.00 3,500.00	1.00 6,200.00	 1,000.00	.50 250.00	.25 500.00	10.00 70,000.00	.05 100.00	30.00 1,800.00	2.00 20.00	1.80 120.00	10.00 100.00	1.00 100.00	150.00 300.00	.50 150.00	.05 750.00	.10 100.00	1.00 100.00	3.00 300.00	 500.00	196,890.00
P. OE CRISTOFARO 38 GLENDOWER RD. ROSLINDALE	3.00 66,000.00	.00 300.00	.50 150.00	3.00 600.00	1.00 300.00	45.00 18,000.00	.60 500.00	.75 1,500.00	2.00 1,400.00	3.00 18,600.00	 50.00	2.00 1,000.00	.50 1,000.00	11.00 77,000.00	.03 60.00	40.00 2,400.00	4.00 10.00	.60 120.00	1.00 10.00	1.00 400.00	75.00 150.00	.20 60.00	.06 900.00	.08 60.00	.50 50.00	1.00 100.00	 200.00	190,920.00
EDWARD M. MATZ 25 ZAMORA ST. JAMAICA PLAIN	2.25 49,500.00	2.00 600.00	1.00 300.00	1.00 200.00	20.00 6,000.00	40.00 16,000.00	2.00 2,000.00	2.00 4,000.00	1.00 700.00	1.00 6,200.00	 1,000.00	1.25 625.00	.50 1,000.00	11.00 77,000.00	.05 100.00	35.00 2,100.00	2.00 20.00	1.00 200.00	10.00 100.00	1.50 150.00	80.00 160.00	.80 240.00	.06 900.00	.06 60.00	1.00 100.00	2.50 250.00	 5,000.00	174,505.00

DRAWN BY K.A. Saunders

CHECKED BY John J. O'Brien

CONTRACT AWARDED TO- EDWARD M. MATZ

I certify this to be a true and accurate summary of bids

Joseph P. Dewey

Chief Engineer of Sewerage Division

NOISE MEASUREMENTS AT VARIOUS LOCATIONS

| | | |

THE COMMONWEALTH OF MASSACHUSETTS

METROPOLITAN DISTRICT COMMISSION

SEWERAGE DIVISION

CANVASS OF BIDS - NORTH METROPOLITAN RELIEF SEWER - SECTION 115A - JUNE 11, 1936.

BIDDERS AND ADDRESSES	1 EARTH EXCAVATION AND BACKFILL IN TRENCH ABOVE SEWER GRADE FOR RELIEF SEWER 25,000 CU. YDS.	2 EARTH EXCAVATION AND BACKFILL IN TIMBERED TRENCH ABOVE SEWER GRADE FOR PIPES AND DRAINS 200 CU. YDS.	3 EARTH EXCAVATION AND BACKFILL OUTSIDE OF TIMBERED TRENCHES 200 CU. YDS.	4 EARTH EXCAVATION AND BACKFILL IN UNTIMBERED TRENCHES ABOVE SEWER GRADE FOR RELIEF SEWER AND DRAINS 1000 CU. YDS.	5 EARTH EXCAVATION FOR BY-PASS AND REGULATOR CHAMBER 2,500 CU. YDS.	6 EARTH EXCAVATION BELOW GRADE 400 CU. YDS	7 LUMBER AND SHEETING USED AND REMOVED 420 M.F.B.M.	8 LUMBER AND SHEETING USED AND LEFT IN PLACE 420 M.F.B.M.	9 STEEL SHEET PILING USED AND REMOVED 1,400 SQ. FT.	10 STEEL SHEET PILING USED AND LEFT IN PLACE 1,400 SQ. FT.	11 ROCK EXCAVATION 700 CU. YDS.	12 PIPE UNDERDRAINS 7,830 LIN. FT.	13 PUMPING AND DISPOSAL OF SEWAGE AND STREAM FLOW AND RESTORATION OF CHANNELS LUMP SUM	14 GRAVEL FILLING 800 CU. YDS.	15 SOIL DRESSING AND SEEDING 1,000 SQ. YDS.	16 CONCRETE 3,500 CU. YDS.	17 CONCRETE IN BY-PASS AND REGULATOR CHAMBER 650 CU. YDS.	18 CONCRETE FOR PIPE CRADLES 100 CU. YDS.	19 REINFORCING AND STRUCTURAL STEEL 40,000 LBS.	20 BRICK MASONRY 130 CU. YDS.	21 GROUT PIPES 20 OF THEM	22 FURNISHING GROUT 150 BAGS OF CEMENT	23 GROUTING OPERATIONS 20 OF THEM	24 PIPE SEWERS AND DRAINS IN TRENCH 200 LIN. FT.	25 CAST IRON PIPE SEWERS, DRAINS AND SIPHONS IN TRENCH 5 TONS	26 RELIEF SEWER IN TUNNEL 90 LIN. FT.	27 36" REINFORCED CONCRETE PIPE RELIEF SEWER 3,300 LIN. FT.	28 WOOD PILES 1,000 LIN. FT.	29 MANHOLE FRAMES AND COVERS 17,000 LBS.	30 MISCELLANEOUS IRON WORK 10,000 LBS.	31 COLD PATCH PAVING 140 SQ. YDS.	32 GRANITE 30 CU. FT.	33 REVETMENT PAVING 120 SQ. YDS.	34 PREPARATION AT SITE CLEANING UP, ETC. LUMP SUM	TOTALS	35 TOTAL ITEMS NO. 1 TO NO. 34 INCLUSIVE BOND-ADD 1/2 PER CENT OF THE ABOVE TOTAL	TOTALS
N. CIBOTTI CO.	3.00	2.00	2.00	2.00	3.00	4.00	10.00	40.00	.50	.60	5.00	2.00		3.00	.50	12.00	28.00	8.00	.03	33.00	3.00	1.30	10.00	3.00	100.00	100.00	7.00	.50	.05	.03	1.50	3.00	4.00				
15 PAGE ST. HYDE PARK	73,000.00	400.00	400.00	2,000.00	7,500.00	1,600.00	4,200.00	16,800.00	700.00	840.00	3,500.00	15,660.00	10,000.00	2,400.00	300.00	42,000.00	18,200.00	800.00	2,000.00	4,530.00	100.00	223.00	200.00	600.00	300.00	9,000.00	23,100.00	500.00	830.00	300.00	210.00	150.00	480.00	300.00	245,965.00	3,689.48	249654.48
J. FITZGERALD CONST. CO.	2.65	3.00	3.00	1.50	3.00	3.00	25.00	32.00	.80	1.00	1.00	1.30		2.23	.43	107.0	14.26	8.30	.03	30.00	2.00	1.30	8.00	1.00	100.00	200.00	7.10	.90	.09	.10	1.20	6.00	1.30				
214 ESSEX ST. BOSTON	66,250.00	600.00	600.00	1,500.00	7,500.00	1,200.00	10,500.00	13,440.00	1,120.00	1,400.00	700.00	10,179.00	6,770.00	1,800.00	430.00	37,450.00	9,269.00	830.00	2,000.00	3,900.00	40.00	223.00	160.00	200.00	500.00	18,000.00	23,430.00	900.00	1,530.00	1,000.00	168.00	180.00	180.00	180.00	225,791.00	3,386.87	229,177.87
COLEMAN BROS. CORP.	3.10	3.10	3.10	5.00	3.10	3.10	25.00	25.00	1.00	1.50	5.00	1.00		1.00	.10	12.00	15.00	13.00	.04	40.00	5.00	1.00	25.00	1.00	100.00	50.00	6.00	1.00	.06	.10	1.50	5.00	4.00				
245 STATE ST. BOSTON	77,500.00	620.00	620.00	5000.00	7,750.00	1,240.00	10,500.00	10,500.00	1,400.00	2,100.00	3,500.00	7,830.00	1,500.00	800.00	100.00	42,000.00	9,750.00	1,300.00	1,600.00	5,200.00	100.00	150.00	500.00	200.00	500.00	4,500.00	19,800.00	1,000.00	1,020.00	1,000.00	210.00	150.00	480.00	1,000.00	221,420.00	3,321.30	224,741.30
C. & R. CONSTRUCTION CO.	1.90	2.50	1.00	1.50	2.00	1.00	4.00	18.00	1.50	2.00	2.00	.20		4.00	.25	16.00	18.00	10.30	.06	35.00	1.00	.65	15.00	1.50	40.00	100.00	8.00	.25	.04	.05	1.00	5.00	3.00				
75 BRADEEN ST. ROSLINDALE	47,500.00	500.00	200.00	1,500.00	5,000.00	400.00	1680.00	7,560.00	2,100.00	2,800.00	1,400.00	1,566.00	26,000.00	800.00	250.00	56,000.00	11,700.00	1,000.00	2,400.00	4,550.00	20.00	97.50	300.00	300.00	200.00	9,000.00	26,400.00	250.00	680.00	600.00	140.00	150.00	360.00	1,000.00	214,403.50	3,216.05	217,619.55
V. J. GRANDE CO.	2.80	2.00	2.00	1.50	4.00	3.00	20.00	25.00	.50	.60	2.00	1.00		2.50	.50	10.00	15.00	8.00	.04	35.00	.50	1.50	20.00	3.00	75.00	100.00	1.50	.25	.60	.10	1.50	3.00	2.00				
100 ACADEMY HILL RD. BOSTON	62,500.00	400.00	400.00	2,500.00	10,000.00	1,200.00	8,400.00	10,500.00	700.00	840.00	1,400.00	7,830.00	10,000.00	2,000.00	500.00	35,000.00	9,750.00	800.00	1,600.00	4,550.00	10.00	225.00	400.00	600.00	375.00	9,000.00	21,450.00	250.00	650.00	1,000.00	210.00	90.00	240.00	1,000.00	206,570.00	3,098.55	209,668.55
P. DE CRISTOFARO CO. INC.	2.00	2.00	1.50	2.80	2.50	1.00	10.00	50.00	.50	1.00	3.00	1.50		1.25	1.00	9.50	10.00	4.00	.05	30.00	.65	.65	1.50	1.50	75.00	75.00	7.00	.40	.075	.07	1.00	1.25	1.50				
38 GLENGOWER RD. ROSLINDALE	50,000.00	400.00	300.00	2,500.00	6,250.00	1,200.00	4,200.00	21,000.00	700.00	1,400.00	2,100.00	11,745.00	6,000.00	1,000.00	1,000.00	33,230.00	6,500.00	400.00	2,000.00	3,900.00	100.00	90.00	300.00	300.00	373.00	6,730.00	23,100.00	400.00	1,275.00	700.00	140.00	37.50	180.00	2,000.00	191,232.50	2,868.49	194,100.99

DRAWN BY J.J. Ramsey

CHECKED BY P. E. Saunders

CONTRACT AWARDED TO - P. DE CRISTOFARO CO. INC.

I certify this to be a true and accurate summary of bids

Joseph P. Dever

Chief Engineer of Sewerage Division

| | | |

THE COMMONWEALTH OF MASSACHUSETTS

METROPOLITAN DISTRICT COMMISSION

SEWERAGE DIVISION

CANVASS OF BIDS - NORTH METROPOLITAN RELIEF SEWER - SECTION 115B - AUGUST 13, 1936.

BIDDERS AND ADDRESSES	1 EARTH EXCAVATION AND BACKFILL IN TIMBERED TRENCH ABOVE SEWER GRADE FOR RELIEF SEWER 25,000 CU. YDS.	2 EARTH EXCAVATION AND BACKFILL IN TIMBERED TRENCH FOR PIPES AND DRAINS 400 CU YDS	3 EARTH EXCAVATION AND BACKFILL OUTSIDE OF TIMBERED TRENCHES 400 CU YDS.	4 EARTH EXCAVATION AND BACKFILL IN UNTIMBERED TRENCH ABOVE SEWER GRADE FOR RELIEF SEWER AND FOR PIPES AND DRAINS 2000 CU. YDS.	5 EARTH EXCAVATION BELOW GRADE 500 CU. YDS.	6 LUMBER AND SHEETING USED AND REMOVED 500 M.F.B.M.	7 LUMBER AND SHEETING USED AND LEFT IN PLACE 500 M.F.B.M.	8 STEEL SHEET PILING USED AND REMOVED 1,000 SQ. FT.	9 STEEL SHEET PILING USED AND LEFT IN PLACE 1,000 SQ. FT.	10 ROCK EXCAVATION 1,000 CU. YDS.	11 PIPE UNDERDRAINS 6,900 LIN. FT.	12 PUMPING AND DISPOSAL OF STREAM FLOW AND RESTORATION OF CHANNELS LUMP SUM	13 GRAVEL FILLING 1,000 CU. YDS.	14 SOIL DRESSING AND SEEDING 1,000 SQ. YDS.	15 CONCRETE 500 CU. YDS.	16 CONCRETE FOR PIPE CRADLES 300 CU. YDS.	17 REINFORCING STEEL 1,000 LBS.	18 BRICK MASONRY 180 CU. YDS.	19 GROUT PIPES 20 OF THEM	20 FURNISHING GROUT 150 BAGS OF CEMENT	21 GROUTING OPERATIONS 20 OF THEM	22 PIPE SEWERS AND DRAINS IN TRENCH 200 LIN. FT.	23 CAST IRON PIPE SEWERS, DRAINS AND SIPHONS IN TRENCH 5 TONS	24 36" REINFORCED CONCRETE PIPE RELIEF SEWER 6,200 LIN. FT.	25 WOOD PILES 1,000 LIN. FT.	26 MANHOLE FRAMES AND COVERS 16,000 LBS.	27 MISCELLANEOUS IRON WORK 2,000 LBS.	28 COLD PATCH PAVING 300 SQ. YDS.	29 GRANITE 100 CU. FT.	30 REVETMENT PAVING 150 SQ. YDS.	31 PREPARATION AT SITE, CLEANING UP, ETC. LUMP SUM	TOTALS ITEMS NO. 1 TO NO. 31 INCLUSIVE	32 BOND - 400 1/4 PER CENT OF THE ABOVE TOTAL	TOTALS CONTRACT PRICE
JOHN WILLIAMS 8 BEECHWOOD ST. DORCHESTER	3.00	8.00	4.00	3.00	5.00	35.00	35.00	1.75	1.75	6.00	1.75		2.00	1.00	18.00	12.00	.05	35.00	10.00	1.00	10.00	4.00	75.00	6.40	.75	.04	.03	1.25	4.00	2.00		212,755.00		215,946.33
	75,000.00	3200.00	1,600.00	6,000.00	2,500.00	17,500.00	17,500.00	1,750.00	1,750.00	6,000.00	12,075.00	1,000.00	2,000.00	1,000.00	9,000.00	3,600.00	50.00	6,300.00	200.00	150.00	200.00	800.00	375.00	39,680.00	750.00	640.00	60.00	375.00	400.00	300.00	1,000.00		3191.33	
J. FITZGERALD CONST. CO. 214 ESSEX ST. BOSTON	1.95	2.00	2.00	1.50	3.00	12.00	32.00	.80	1.00	8.50	1.25		1.75	.20	12.00	5.00	.50	32.00	5.00	1.50	10.00	1.00	90.00	8.00	1.00	.06	.06	1.00	5.00	3.00		180,210.00		182,913.15
	48,750.00	800.00	800.00	3,000.00	1,500.00	6,000.00	16,000.00	800.00	1,000.00	8,500.00	8,625.00	7,500.00	1,750.00	450.00	6,000.00	2,700.00	50.00	5,760.00	60.00	225.00	200.00	300.00	450.00	49,600.00	1,000.00	960.00	180.00	300.00	500.00	450.00	6,000.00		2703.15	
V. J. GRANDE CO. 100 ACADEMY HILL RD. BRIGHTON	1.75	2.00	1.00	1.50	2.50	10.00	30.00	.50	.60	1.25	8.00		2.00	.20	2.00	8.00	.06	35.00	.50	.75	10.00	2.00	45.00	10.00	.25	.25	.06	1.00	1.50	1.00		177,137.50		179,794.56
	43,750.00	800.00	800.00	3,000.00	1,250.00	5,000.00	15,000.00	500.00	600.00	1,750.00	10,350.00	12,000.00	2,000.00	200.00	4,500.00	2,400.00	60.00	6,300.00	10.00	112.50	200.00	400.00	225.00	62,000.00	250.00	960.00	120.00	300.00	150.00	150.00	2,000.00		2,657.06	
COLEMAN BROS. CORP. 245 STATE ST. BOSTON	3.00	1.00	1.00	5.00	2.00	20.00	20.00	.50	1.00	3.00	1.00		1.00	.50	10.00	5.00	.05	35.00	1.00	1.00	10.00	1.00	100.00	5.00	.50	.05	.10	1.00	4.00	2.00		171,620.00		174,194.30
	75,000.00	400.00	400.00	6,000.00	1,000.00	10,000.00	10,000.00	500.00	1,000.00	3,000.00	6,900.00	5,500.00	600.00	500.00	5,000.00	3,900.00	50.00	6,300.00	20.00	150.00	200.00	200.00	500.00	31,000.00	500.00	800.00	200.00	300.00	400.00	300.00	1,000.00		2,574.30	
ZOPPO & CIVITARESE 480 METROPOLITAN AVE. HYDE PARK	2.00	2.00	2.00	1.50	3.00	10.00	35.00	.40	.40	5.00	1.00		3.00	.30	10.00	8.00	.05	35.00	10.00	1.50	10.00	2.00	100.00	7.50	.25	.05	.05	1.50	8.00	2.00		165,575.00		168,058.63
	50,000.00	800.00	800.00	3,000.00	1,500.00	5,000.00	17,500.00	400.00	400.00	5,000.00	6,900.00	6,000.00	3,000.00	300.00	5,000.00	2,400.00	50.00	6,300.00	200.00	225.00	200.00	400.00	500.00	46,500.00	250.00	800.00	100.00	450.00	300.00	300.00	1,000.00		2,483.63	
EDWARD M. MATZ INC. 25 ZAMORA ST. JAMAICA PLAIN	.60	2.20	3.00	1.30	1.00	5.00	50.00	1.00	1.00	3.00	1.00		1.25	1.00	12.50	11.00	.07	35.00	2.00	1.50	30.00	3.00	40.00	6.50	.50	.10	.10	2.00	5.00	3.00		164,565.00		167,033.48
	45,000.00	880.00	1,200.00	2,600.00	500.00	2,500.00	25,000.00	1,000.00	1,000.00	4,000.00	6,900.00	5,000.00	1,250.00	1,000.00	6,250.00	3,300.00	70.00	6,300.00	40.00	225.00	600.00	600.00	200.00	40,300.00	500.00	1,600.00	200.00	600.00	500.00	450.00	5,000.00		2,468.48	
P. DE CRISTOFARO CO. INC. 38 GLENDOWER RD. ROSLINDALE	.60	1.50	1.75	1.50	3.00	5.00	40.00	5.00	1.00	3.00	1.50		1.50	2.00	6.00	6.00	.50	30.00	.50	.60	1.50	2.00	75.00	0.00	.40	.075	.07	1.00	2.00	1.50		164,270.00		166,734.05
	37,500.00	600.00	700.00	3,000.00	1,500.00	2,500.00	20,000.00	1,000.00	1,000.00	3,000.00	10,350.00	3,000.00	1,500.00	1,000.00	3,000.00	1,800.00	50.00	5,400.00	10.00	90.00	30.00	400.00	375.00	62,000.00	400.00	1,200.00	140.00	300.00	200.00	225.00	2,000.00		2,464.05	
C. & R. CONST. CO. 75 BRADEEN ST. ROSLINDALE	1.40	1.00	1.00	1.00	.70	8.00	40.00	.40	.40	3.00	.95		.40	.20	6.00	5.00	.03	30.00	.50	.60	1.00	1.00	40.00	11.50	.10	.04	.05	1.00	1.00	1.00		157,220.00		159,578.30
	35,000.00	400.00	400.00	2,000.00	500.00	1,000.00	20,000.00	400.00	400.00	3,000.00	1,380.00	8,500.00	400.00	200.00	3,000.00	1,500.00	30.00	5,400.00	10.00	90.00	20.00	200.00	200.00	71,300.00	100.00	640.00	100.00	300.00	100.00	150.00	500.00		2,358.30	

DRAWN BY S.H.

CHECKED BY L.S.

CONTRACT AWARDED TO - C. & R. CONSTRUCTION CO.

I certify this to be a true and accurate summary of bids

Joseph P. Dever

Chief Engineer of Sewerage Division

| | | |

was started by the C. & R. Construction Company on or about March 31, 1936, and on December 31, 1936, was 63% completed.

North Metropolitan Relief Sewer, Section 113

This work is located in Winchester and includes construction of approximately 4,272 feet of concrete sewer together with a two-pipe 36 inch cast-iron siphon, and a relocation of the Aberjona River adjacent to the Boston & Maine Railroad and directly opposite Wedgemere Station. Most of the work involved open cut construction. However, a tunnel approximately 140 feet long was constructed under Bacon Street because of a deep cut, and a tunnel approximately 225 feet long through Winchester Square to avoid great public inconvenience.

Bids were opened on this section on February 19, 1936. The contract was awarded by the Metropolitan District Commission on February 27, 1936, and accepted by the Federal Emergency Administration of Public Works on March 31, 1936. Work was started by A. Baruffaldi Company on April 9, 1936, and on December 31, 1936, was 97% completed.

North Metropolitan Relief Sewer, Section 114

This work is located in Winchester and includes construction of approximately 6,268 feet of concrete sewer varying in size from 66 inches in diameter at the lower end to 50 inches in diameter at the upper end. At the lower end it was deemed advisable to construct a sewer through an abandoned railroad culvert and use considerable amounts of steel sheeting together with a well-point system of drainage because of quicksand, and at the upper end it is being deemed advisable to tunnel under the railroad using a steel shield.

Bids were opened on this section on February 27, 1936. The contract was awarded by the Metropolitan District Commission on March 5, 1936, and accepted by the Federal Emergency Administration of Public Works on March 31, 1936. Work was started by Edward M. Matz on April 6, 1936 and on December 31, 1936, was 30% completed.

North Metropolitan Relief Sewer, Section 115A

This work is located in Winchester, Woburn, and Stoneham and includes the construction of approximately 7,830 feet of sewer, together with the construction of a by-pass and regulator chamber and facilities for temporarily carrying the flow of certain existing sewers. This sewer varies in size from 50 inches in diameter at the lower end to 36 inches in diameter at the upper end. The lower end is constructed of concrete cast in place, while the upper end is constructed of 36-inch pre-cast, reinforced concrete, centrifugally spun pipe. Most of the work was done by the open cut method. However, at the upper end a tunnel approximately 90 feet long was constructed under the railroad.

Bids were opened on this section on June 11, 1936. The contract was awarded by the Metropolitan District Commission on June 18, 1936, and accepted by the Federal Emergency Administration of Public Works on July 14, 1936. Work was started by the P. DeCristofaro Company on July 15, 1936, and on December 31, 1936, was 84% completed.

North Metropolitan Relief Sewer, Section 115B

This work is located in Stoneham and includes the construction of approximately 900 feet of 36-inch, reinforced centrifugally spun concrete pipe. This work is being constructed by the open cut method, and considerable rock is being encountered.

Bids were opened on this section on August 13, 1936. The contract was awarded by the Metropolitan District Commission on August 20, 1936, and accepted by the Federal Emergency Administration of Public Works on September 14, 1936. Work was started by the C. &. R. Construction Company on or about September 23, 1936, and on December 31, 1936, was 49% completed.

X. Other Reports

Tables, statistics and financial statements relating to the several divisions are hereto appended.

Respectfully submitted,

E. C. Hultman
Metropolitan District Commissioner.

February 27, 1936.

Appendix No. 1

FINANCIAL STATEMENT

of the

METROPOLITAN DISTRICT COMMISSION

For the Year Ending November 30, 1936

Construction

	Condition of Fund as of Dec. 1, 1935	Amount available 1936	Expended 1936	Bala. Dec. 1,
Parks Division				
Metropolitan Parks Construction Fund, Series I	$9,093,043.96			
Receipts	198,942.81			
	$9,291,986.77			
Expended to Dec. 1, 1935	9,264,694.59			
		$27,292.18	–	*$27,29
Metropolitan Parks Construction Fund, Series II	$9,614,780.63			
Receipts	29,934.16			
	$9,644,714.79			
Expended to Dec. 1, 1935	9,642,663.71			
		$2,051.08	–	*$2,05
Northern Traffic Route Construction Fund	$3,000,000.00			
Receipts	18,540.30			
	$3,018,540.30			
Expended to Dec. 1, 1935	2,953,595.56			
		$64,944.74	–	*$64,94
Charles River Basin Improvements Chapter 371, Acts of 1929	$2,305,000.00			
Less Chapter 179, Acts of 1931	25,000.00			
Interest	129,110.90			
	$2,409,110.90			
Expended to Dec. 1, 1935	2,105,494.69			
		$303,616.21	$3,015.73	$300,60
Land in Saugus and Wakefield, Chapter 384, Acts of 1934	$40,000.00			
Expended to Dec. 1, 1935	39,015.75			
		$984.25	–	$98
Bath House, Watertown				
Chapter 331, Acts of 1936		$32,500.00		
Chapter 432, Acts of 1936		32,500.00		
		$65,000.00	$38.01	$64,96
Improvement of Land, Old Colony Parkway, Chapter 497, Acts of 1935	$100,000.00			
Transferred to Bath House account	70,000.00			
	$30,000.00			
Expended to Dec. 1, 1935	39.84			
		$29,960.16	$357.97	$29,60
Improvement of Land, Old Colony Parkway, Bath House		$70,000.00	$44,012.61	$25,98
Reconstruction Mystic River Bridge, Chapter 432, Acts of 1936		$65,625.00	$27,384.30	$38,24
Purchase of Moody Street Dam, Waltham, Chapter 448, Acts of 1935		$25,000.00	$25,000.00	
Sewerage Division				
Metropolitan Sewerage Construction Fund, North System: General				
Receipts		$8,090.00	$8,090.00	
Metropolitan Sewerage Construction Fund, North System: Specials:				
New Mystic Valley Main Sewer Chapter 184, Acts of 1927	$450,000.00			
Chapter 381, Acts of 1931	20,482.25			
	$470,482.25			
Expended to Dec. 1, 1935	460,978.61			
		$9,503.64	$309.25	$9,19
Massachusetts State Project D-101 P.W.A. Docket No. Mass. 1098R.	$3,000,000.00			
Expended to Dec. 1, 1935	11,754.37			
		$2,988,245.63	$1,362,774.37	$1,625,47

*Reverted.

Construction — Continued

Sewerage Division — *Continued*	Condition of Fund as of Dec. 1, 1935	Amount available 1936	Expended 1936	Balance Dec. 1, 1936
etropolitan Sewerage Construction Fund, South System:				
eneral	$10,005,151.75			
eceipts	24,599.61			
	$10,029,751.36			
pended to Dec. 1, 1935	10,026,569.58			
		$3,181.78	–	$3,181.78
ecials:				
New Neponset Valley Sewer				
Chapter 384, Acts of 1928	$2,365,000.00			
Chapter 384, Acts of 1934	10,000.00			
	$2,375,000.00			
Expended to Dec. 1, 1935	2,374,213.83			
		$786.17	–	$786.17
Gravity Drainage, City of Quincy, Chapter 240, Acts of 1928	$150,000.00			
Expended to Dec. 1, 1935	143,070.91			
		$6,929.09	$909.57	$6,019.52
Less amount transferred to Hyde Park Branch Sewer				5,000.00
				$1,019.52
Sewers in Quincy, Weymouth and Braintree, Chapter 398, Acts of 1930	$600,000.00			
Expended to Dec. 1, 1935	558,956.56			
		$41,043.44	$12,242.12	$28,801.32
Boston-Newton Main Sewer, Chapter 205, Acts of 1932	$100,000.00			
Expended to Dec. 1, 1935	94,704.65			
		$5,295.35	$1,000.00	$4,295.35
Hyde Park Branch Sewer, Chapter 384, Acts of 1934	$20,000.00			
Transferred from Gravity Drainage, City of Quincy	5,000.00			
	$25,000.00			
Expended to Dec. 1, 1935	23,913.73			
		$1,086.27	$738.81	$347.46

Water Division

tropolitan Water Construction Fund:				
General	$43,070,000.00			
Receipts	333,493.10			
	$43,403,493.10			
Expended to Dec. 1, 1935	43,347,586.01			
		$55,907.09		
Receipts, year ending Nov. 30, 1936		699.16		
		$56,606.25	$14,080.16	$42,526.09
ecials:				
Property for Protection of Water Supply, Chapter 304, Acts of 1936		$10,000.00	$8,037.43	$1,962.57
mprovements, Supply Mains, etc.				
Chapter 245, Acts of 1931	$400,000.00			
Chapter 170, Acts of 1932	350,000.00			
Chapter 174, Acts of 1933	250,000.00			
Chapter 162, Acts of 1934	300,000.00			
Chapter 249, Acts of 1935	300,000.00			
	$1,600,000.00			
Expended to Dec. 1, 1935	1,411,998.08			
		$188,001.92		
Chapter 304, Acts of 1936		300,000.00		
		$488,001.92	$84,742.52	$403,259.40
mprovements, Belmont, Watertown and Arlington:				
Chapter 384, Acts of 1934	$50,000.00			
Chapter 249, Acts of 1935	150,000.00			
	$200,000.00			
Expended to Dec. 1, 1935	121,469.70			
		$78,530.30		
Chapter 432, Acts of 1936		85,000.00		
		$163,530.30	$109,697.07	$53,833.23
athing Facilities:				
Chapter 384, Acts of 1934	$12,000.00			
xpended to Dec. 1, 1935	10,649.94			
		$1,350.06	$1,317.92	$32.14
ish Way, Quinapoxet Dam, Chapter 304, Acts of 1936		$4,000.00	$3,193.28	$806.72

Miscellaneous

	Condition of Fund as of Dec. 1, 1935	Amount available 1936	Expended 1936	Balan Dec. 1,
Parks Division				
Metropolitan Parks Expense Fund				
Special:				
Bath House, Mystic Lakes, Chapter 426, Acts of 1930	$50,000.00			
Transferred to Metropolitan Parks Expense Fund	35,000.00			
	$15,000.00			
Expended to Dec. 1, 1935	11,877.08			
		$3,122.92	–	$3,122
Metropolitan Parks Trust Fund:				
Total receipts to Dec. 1, 1935	$42,026.67			
Total expenditures to Dec. 1, 1935	38,140.11			
		$3,886.56		
Receipts year ending Nov. 30, 1936		124.39		
		$4,010.95	–	$4,01
Edwin U. Curtis Memorial Trust Fund:				
Total receipts to Dec. 1, 1935	$1,915.37			
Total expenditures to Dec. 1, 1935	237.59			
		$1,677.78		
Receipts year ending Nov. 30, 1936		63.00		
		$1,740.78	–	$1,74
Drainage in Everett, Malden and Revere:				
Total deposited by above cities	$70,000.00			
Expended to Dec. 1, 1935	61,497.50			
		$8,502.50	–	$8,50
Emergency Public Works Commission—Construction Massachusetts State Project D-1 P.W.A. Docket No. 4478:				
(Metropolitan District Commission—Wellington Bridge)	$956,000.00			
Expended to Dec. 1, 1935	494,634.71			
		$461,365.29	$397,902.75	$63,46

Maintenance

Parks Division

Metropolitan Parts Maintenance Fund:				
General:				
Chapter 304, Acts of 1936		$1,087,171.00		
Chapter 432, Acts of 1936		10,000.00		
Balance brought forward from 1935 appropriation to cover 1935 expenditures on 1936 books		30,664.42		
		$1,127,835.42	$1,087,923.32	$39,91
Specials:				
Band Concerts:				
Chapter 304, Acts of 1936		$20,000.00	$19,947.65	*$5
Aberjona River Improvements, Chapter 384, Acts of 1934	$6,000.00			
Expended to Dec. 1, 1935	3,645.55			
		$2,354.45	–	*$2,35
Expenses for Procuring W.P.A. Funds, Chapter 304, Acts of 1936		$20,000.00	$13,562.20	$6,43
Repairs, Lynn Sea Wall, Chapter 304, Acts of 1936		$10,000.00	$3,968.43	$6,03
Investigations, Roadway, Waterway Improvements:				
Chapter 432, Acts of 1936		$750.00	$183.07	$56
Flood Damage, Chapter 432, Acts of 1936		$30,000.00	$17,410.37	$12,58
Certain Lighting, Cambridge, Chapter 432, Acts of 1936		$6,144.00	–	$6,14
Bulkhead, Lynn Playground, Chapter 437, Acts of 1936		$10,000.00	$4,978.55	$5,02
Metropolitan Parks Maintenance Fund, Boulevards:				
General:				
Chapter 304, Acts of 1936		$674,180.00		
Chapter 432, Acts of 1936		1,275.00		
Balance brought forward from 1935 appropriation to cover 1935 expenditures on 1936 books		21,133.09		
		$696,588.09	$663,697.85	$32,89
Specials:				
Extension of Quincy Shore Reservation:				
Chapter 343, Acts of 1927 (Reappropriated Chapter 386, Acts of 1929)	$35,000.00			
Expended to Dec. 1, 1935	34,904.40			
		$95.60	-	*$9
Land, Boulevard, Newburyport Turnpike to Lynn Woods Parkway:				
Chapter 426, Acts of 1930	$10,000.00			
Expended to Dec. 1, 1935	6,770.93			
		$3,229.07	–	*$3,22

*Reverted.

Maintenance — Continued

	Condition of Fund as of Dec. 1, 1935	Amount available 1936	Expended 1936	Balance Dec. 1, 1936
Parks Division — *Continued*				
Metropolitan Parks Maintenance Fund, Boulevards: (*Continued*)				
Specials: (*Continued*)				
Circumferential Highway:				
Chapter 398, Acts of 1926	$115,000.00			
Chapter 386, Acts of 1929	159,000.00			
Chapter 115, Acts of 1930	371,000.00			
Chapter 460, Acts of 1931	28,947.37			
Chapter 170, Acts of 1932	21,052.63			
	$695,000.00			
Expended to Dec. 1, 1935	685,790.92			
		$9,209.08	–	$9,209.08
Boulevard, Fellsway to Mystic Avenue, Medford:				
Chapter 460, Acts of 1931	$189,473.68			
Chapter 170, Acts of 1932	210,526.32			
Chapter 384, Acts of 1934	100,000.00			
Chapter 497, Acts of 1935	20,000.00			
	$520,000.00			
Expended to Dec. 1, 1935	510,289.27			
		$9,710.73	$8,161.48	$1,549.25
Brookline-Newton Boulevard:				
Chapter 460, Acts of 1931	$231,578.95			
Chapter 170, Acts of 1932	168,421.05			
	$400,000.00			
Expended to Dec. 1, 1935	298,117.46			
		$101,882.54	$ 2,715.07	$99,167.47
Grading and Landscaping:				
Chapter 304, Acts of 1936		$25,000.00	$16,550.88	$8,449.12
Resurfacing Boulevards and Parkways:				
Chapter 304, Acts of 1936		$275,100.00		
Balance brought forward from 1935 appropriation to cover 1935 expenditures on 1936 books		21,880.85		
		$296,980.85	$265,246.24	$31,734.61
Expenses for Procuring W.P.A. Funds:				
Chapter 304, Acts of 1936		$13,000.00	$6,361.83	$6,638.17
Flood Damage:				
Chapter 432, Acts of 1936		$20,000.00	$15,454.47	$4,545.53
Charles River Basin Maintenance Fund:				
Chapter 304, Acts of 1936		$251,626.00		
Chapter 432, Acts of 1936		4,000.00		
Balance brought forward from 1935 appropriation to cover 1935 expenditures on 1936 books		23,663.12		
		$279,289.12	$259,173.69	$20,115.43
Metropolitan Parks Maintenance Fund, Nantasket:				
Chapter 304, Acts of 1936		$95,505.00		
Chapter 432, Acts of 1936		125.00		
Balance brought forward from 1935 appropriation to cover 1935 expenditures on 1936 books		103.59		
		$95,733.59	$95,085.29	$648.30
Metropolitan Parks Maintenance Fund, Wellington Bridge:				
Chapter 304, Acts of 1936		$12,702.00		
Balance brought forward from 1935 appropriation to cover 1935 expenditures on 1936 books		37.24		
		$12,739.24	$12,678.36	$60.88
Maintenance of Bunker Hill Monument:				
Chapter 304, Acts of 1936		$11,625.00	$10,597.28	$1,027.72

Sewerage Division

Metropolitan Sewerage Maintenance Fund, North System:				
Chapter 304, Acts of 1936		$386,425.00		
Chapter 432, Acts of 1936		8,000.00		
Balance brought forward from 1935 appropriation to cover 1935 expenditures on 1936 books		22,560.36		
		$416,985.36	$393,556.52	$23,428.84
Metropolitan Sewerage Maintenance Fund, South System:				
Chapter 304, Acts of 1936		$289,533.00		
Chapter 432, Acts of 1936		250.00		
Balance brought forward from 1935 appropriation to cover 1935 expenditures on 1936 books		15,567.62		
		$305,350.62	$294,573.49	$10,777.13

Reverted.

Maintenance — Continued

	Condition of Fund as of Dec. 1, 1935	Amount available 1936	Expended 1936	Balance Dec. 1, 1936
Water Division				
Metropolitan Water Maintenance Fund:				
General:				
Chapter 304, Acts of 1936		$945,719.00		
Chapter 432, Acts of 1936		500.00		
Balance brought forward from 1935 appropriation to cover 1935 expenditures on 1936 books		30,188.70		
		$976,407.70	$952,614.11	$23,793.59
Special:				
Additional Pumping Equipment:				
Chapter 245, Acts of 1931	$50,000.00			
Chapter 170, Acts of 1932	50,000.00			
Chapter 174, Acts of 1933	50,000.00			
	$150,000.00			
Expended to Dec. 1, 1935	147,981.45			
		$2,018.55	$1,993.95	$24.60

Receipts — Year Ended November 30, 1936

Parks Division

Credited to:		
Metropolitan Parks Fund, Special	$99,238.74	
Metropolitan Parks Maintenance Fund, General	37,220.80	
Metropolitan Parks Maintenance Fund, Boulevards	*795.31	
General Revenue	2,980.50	
		$140,235.35

*Includes Prior Years Account $26.50.

Sewerage Division

Credited to:		
Metropolitan Sewerage Construction Fund, North System	$8,090.00	
Metropolitan Sewerage Sinking Fund, North System	620.00	
Metropolitan Sewerage Maintenance Fund, North System	7,378.82	
Metropolitan Sewerage Maintenance Fund, South System	7,320.91	
Metropolitan Sewerage Interest Fund, North System	60.00	
		$23,469.73

Water Division

Credited to:		
Metropolitan Water Loan Interest Fund	$42.00	
Metropolitan Water Construction Fund	699.16	
Metropolitan Water Sinking Fund	126,368.68	
Metropolitan Water Maintenance Fund	16,497.93	
		$143,607.77
		$307,312.85

Appendix No. 2

Table 1

The following is a record of the traffic through locks and drawbridges during the year.

Charles River Dam Lock and Drawbridge

Number of openings of highway drawbridge	1,906
Number of openings of lock	4,043
Number of vessels	2,143
Number of small boats	6,162
Number of rafts	2
Coal (tons)	82,459
Sand (tons)	135,725
Gravel (tons)	55,905
Oil (bbls.)	612,060
Oil (gals.)	5,781,500
Coke (tons)	9,647
Granite (tons)	980
Mud (tons)	1,900
Lumber (ft. B. M.)	2,467,900
Lathes (ft. lin.)	540,000
Piles	74

Cradock Bridge Lock

Number of openings	173
Number of boats through lock	181
Number of boats over rolls	57

Dorchester Bay Drawbridge

Number of openings	726
Number of vessels	777

General Edwards Drawbridge

Number of openings	464
Number of vessels	527

Malden River Drawbridge

Number of openings	111
Number of vessels	155

Mystic River Drawbridge

Number of openings	2
Number of vessels	2

Neponset River Drawbridge

Number of openings	320
Number of vessels	516

Wellington Drawbridge

Number of openings	35
Number of vessels	75

Table 4

Lengths of Roads and Bridle Paths in Reservations not Open to Motor Vehicles

	Miles
Blue Hills Reservation	66.08
Middlesex Fells Reservation	25.00
Stony Brook Reservation	19.60
Beaver Brook Reservation	.22
Charles River Reservation	.89
Hammond Pond Parkway	2.00
	113.79

Table 5

Electric Street Lights on Parkways and Reservations

	Lights	
Alewife Brook Parkway (27–600 c. p., 1–1500 c. p.)	28	
Blue Hills Parkway (600 c.p.)	59	
Blue Hills Reservation, Hillside Street (80 c.p.)	14	
Charles River Dam, Reservation (1500 c.p.)	9	
Charles River Dam, Roadway (1000 c.p.)	20	
Charles River Reservation, Boston Embankment (250 c.p.)	80	
Charles River Reservation, Embankment Road (2–100 c.p., 17–600 c.p.)	19	
Charles River Reservation, North Beacon Street (4-1500 c.p., 9–1000 c.p.)	13	
Charles River Reservation, Soldiers' Field Road (63–1000 c.p., 54–1500 c.p.)	117	
Clarence R. Edwards Bridge (800 c.p.)	24	
Dorchester Bay Bridge (1500 c.p.)	8	
Fresh Pond Parkway (15–250 c.p.)	15	
Furnace Brook Parkway (600 c.p.)	58	[7]
Harvard Bridge (600 c.p.)	24	
Larz Anderson Bridge (100 c.p.)	24	
Lynn Fells Parkway (600 c.p.)	28	[2]
Lynn Shore Reservation (4–1000 c.p., 44–600 c.p.)	48	[3]
Lynnway (1–1000 c.p., 10–600 c.p.)	11	
Memorial Drive (32–600 c.p., 213–250 c.p.)	245	
Middlesex Fells Parkway (7–1500 c.p., 243–600 c.p.)	250	[4]
Middlesex Fells Reservation (2–80 c.p., 35–250 c.p., 21–600 c.p.)	58	[5]
Mystic Valley Parkway (1–250 c.p., 89–600 c.p.)	90	[6]
Nahant Beach Parkway (600 c.p.)	16	[7]
Nantasket Beach Reservation (1000 c.p.)	48	[8]
Neponset Bridge (600 c.p.)	16	
Neponset Valley Parkway (600 c.p.)	21	
Old Colony Parkway (47–1500 c.p., 2–1000 c.p.)	49	
Quincy Shore Boulevard (600 c.p.)	57	[9]
Revere Beach Parkway (600 c.p.)	191	[10]
Revere Beach Reservation (2–60 c.p., 1–250 c.p., 107–1500 c.p.)	110	[11]
River Street Bridge (250 c.p.)	8	
Weeks Bridge (100 c.p.)	24	
Wellington Bridge (800 c.p.)	22	
Western Avenue Bridge (250 c.p.)	8	
West Roxbury Parkway (27–600 c.p., 2–1000 c.p.)	29	[12]
Winthrop Parkway (14–250 c.p., 7–600 c.p.)	21	
Winthrop Shore Reservation (600 c.p.)	23	
Woburn Parkway (600 c.p.)	4	[13]
	1,890	

[1] Nineteen all night, except November 1 to March 31, until 1 A.M. Fourteen all night, April 1 to October 31.
[2] Seventeen all year until 1 A.M.
[3] Three 600 c.p. June 1 to December 1.
[4] Four 600 c.p. all year until 1 A.M.
[5] Two 80 c.p., thirty-five 250 c.p. and five 600 c.p. all year until 1 A.M.
[6] Ten 600 c.p. all night, except November 1 to March 31 until 1 A.M. Thirty-two 600 c.p. all year until 1 A.M.
[7] Four, June 1 to December 1.
[8] Twelve, June 1 to October 31. Fourteen in summer only.
[9] Forty-one all night, except November 1 to March 31 to 1 A.M. Ten all night, April 1 to October 31. Six all year until 1 A.M.
[10] Twenty-nine all night, April 1 to October 31. Two until 1 A.M. all year.
[11] Twenty-seven 1,500 c.p. all night, May 1 to October 31. Thirty-one 1,500 c.p. to midnight, June 1 to September 30. One 60 c.p. all night, May 1 to September 30.
[12] Twenty-seven 600 c.p. all night, except November 1 to March 31, until 1 A.M.
[13] Until 1 A.M.

Table 6

Miles of Seashore

	Miles
Lynn Shore	1.50
Nahant Beach	2.93
Nantasket Beach	1.02
Quincy Shore	2.19
Revere Beach	2.74
Winthrop Shore	1.71
Total	12.09

Lengths of Sea Walls

	Miles
Lynn Shore	1.30
Nahant Beach Parkway, north of Wilson Road	.35
Nantasket Beach Reservation.	.54
Quincy Shore Reservation, shore protection south of Webster Street	1.08
Quincy Shore Reservation, southerly end	.15
Revere Beach at Eliot Circle	.15
Revere Beach at Northern Circle	.08
Revere Beach, shore protection, south of Northern Circle	.28
Revere Beach, shore protection, bathhouse shelter to Revere Street shelter	.29
Winthrop Parkway, Revere and Winthrop, Broad Sound Avenue to Sewall Avenue	.52
Winthrop Shore, bridge to Great Head	1.04
Winthrop Shore, bridge to Grover's Cliff	.23
Total	6.01

Miles of River Bank

	Miles
Alewife Brook	4.50
Charles River	33.97
Mystic River	8.41
Neponset River	15.86
Total	62.74

Table 7

Bridges

Drawbridges	7
Footbridges	14
Reinforced concrete bridges	24*
Steel bridges	18
Stone masonry bridge	1
Wooden bridges	5
Total	69

Culverts

Reinforced concrete and other masonry culverts	60

* High Street Bridge under construc tion.

TABLE 8

Beaver Brook Reservation, small wooden dams	2
Blue Hills Parkway, small wooden dam at Canton Avenue Circle	1
Blue Hills Reservation, small wooden dams at St. Moritz	2
Blue Hills Reservation, small concrete dam at Ponkapoag Pond	1
Breakheart Reservation, small concrete dams	2
Charles River Reservation, wooden dam at Watertown, 220 feet in length	1
Charles River Reservation, Charles River Basin, tidal dam, 1,200 feet in length	1
Charles River Reservation, small stone dam in branch below Washington Street, Newton Lower Falls	1
Charles River Reservation, reinforced concrete dam at Washington Street, Newton Lower Falls, 140 feet in length	1
Charles River Reservation, stone masonry dam with stop planks, at Moody Street Bridge, about 170 feet in length	1
Furnace Brook Parkway, reinforced concrete dam upstream from Black's Creek Bridge	1
Hemlock Gorge Reservation, small stone masonry dam with stop planks, in gorge	1
Hemlock Gorge Reservation, small reinforced concrete dam on east branch of River, Newton Upper Falls	1
Hemlock Gorge Reservation, reinforced concrete dam in Charles River at Boylston Street, Newton Upper Falls, 90 feet in length	1
Hemlock Gorge Reservation, small concrete dam at Reservoir Street	1
Mystic River Reservation, reinforced concrete tidal dam at Cradock Bridge, 100 feet in length, weirs 400 feet in length	1
Total	19

Lock Gates, Sluice Gates and Tide Gates

Charles River Reservation, Charles River Basin Tidal Dam, 6 lock gates, 13 sluice gates, 43 tide gates.
Mystic River Reservation, Cradock Bridge Tidal Dam, 2 lock gates, 4 sluice gates, 8 tide gates.
Quincy Shore Reservation, 8 tide gates.
Old Colony Parkway, Tenean Street, 1 tide gate.

TABLE 2. — *Metropolitan Park System — Areas of Reservations and Parkways — December 31, 1936.*

(RESERVATIONS ACRES)

		Beaver Brook	Blue Hills	Breakheart	Bunker Hill	Charles River	Hemlock Gorge	King's Beach and Lynn Shore	Middlesex Fells	Mystic River	Nantasket Beach	Neponset River	Quincy Shore	Revere Beach	Stony Brook	Winthrop Shore	Total Acres
	Cities.																
1	Boston	–	–	–	6.05	204.33	–	–	–	–	–	145.57	–	–	463.72	–	819.67
2	Cambridge	–	–	–	–	223.98	–	–	–	–	–	–	–	–	–	–	223.98
3	Chelsea	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
4	Everett	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
5	Lynn	–	–	–	–	–	–	19.59	–	–	–	–	–	–	–	–	19.59
6	Malden	–	–	–	–	–	–	–	59.53	–	–	–	–	–	–	–	59.53
7	Medford	–	–	–	–	–	–	–	963.73	42.32	–	–	–	–	–	–	1,006.05
8	Melrose	–	–	–	–	–	–	–	180.19	–	–	–	–	–	–	–	180.19
9	Newton	–	–	–	–	187.64	4.24	–	–	–	–	–	–	–	–	–	191.88
10	Quincy	–	2,562.56	–	–	–	–	–	–	–	–	–	40.75	–	–	–	2,603.31
11	Revere	–	–	–	–	–	–	–	–	–	–	–	–	64.29	–	–	64.29
12	Somerville	–	–	–	–	–	–	–	–	5.91	–	–	–	–	–	–	5.91
13	Waltham	42.77	–	–	–	38.71	–	–	–	–	–	–	–	–	–	–	81.48
14	Woburn	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
	Towns.																
15	Arlington	–	–	–	–	–	–	–	–	7.83	–	–	–	–	–	–	7.83
16	Belmont	15.55	–	–	–	–	–	–	–	–	–	–	–	–	–	–	15.55
17	Braintree	–	69.75	–	–	–	–	–	–	–	–	–	–	–	–	–	69.75
18	Brookline	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
19	Canton	–	571.84	–	–	–	–	–	–	–	–	264.26	–	–	–	–	836.10
20	Dedham	–	–	–	–	6.51	–	–	–	–	–	234.54	–	–	–	–	241.05
21	Dover	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
22	Hingham	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
23	Hull	–	–	–	–	–	–	–	–	–	25.59	–	–	–	–	–	25.59
24	Milton	–	1,555.78	–	–	–	–	–	–	–	–	269.09	–	–	–	–	1,824.87
25	Nahant	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
26	Needham	–	–	–	–	–	14.24	–	–	–	–	–	–	–	–	–	14.24
	(Randolph)	–	885.25	–	–	–	–	–	–	–	–	–	–	–	–	–	885.25
27	Saugus	–	–	532.05	–	–	–	–	–	–	–	–	–	–	–	–	532.05
28	Stoneham	–	–	–	–	–	–	–	705.41	–	–	–	–	–	–	–	705.41
29	Swampscott	–	–	–	–	–	–	3.10	–	–	–	–	–	–	–	–	3.10
30	Wakefield	–	–	87.48	–	–	–	–	–	–	–	–	–	–	–	–	87.48
31	Watertown	–	–	–	–	80.95	–	–	–	–	–	–	–	–	–	–	80.95
32	Wellesley	–	–	–	–	66.07	4.58	–	–	–	–	–	–	–	–	–	70.65
33	Weston	–	–	–	–	152.52	–	–	–	–	–	–	–	–	–	–	152.52
34	Westwood	–	–	–	–	–	–	–	–	–	–	6.57	–	–	–	–	6.57
35	Weymouth	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
36	Winchester	–	–	–	–	–	–	–	261.93	–	–	–	–	–	–	–	261.93
37	Winthrop	–	–	–	–	–	–	–	–	–	–	–	–	–	–	16.83	16.83
		58.32	5,645.18	619.53	6.05	960.71	23.06	22.69	2,170.79	56.06	25.59	920.03	40.75	64.29	463.72	16.83	11,093.60

(PARKWAYS ACRES)

		Alewife Brook	Blue Hills	Veterans of Foreign Wars	Dedham	Fresh Pond	Furnace Brook	Hammond Pond	Lynn Fells	Lynnway	Middlesex Fells	Mystic Valley	Nahant Beach	Neponset River	Old Colony	Quannapowitt	Revere Beach	West Roxbury	Winthrop	Woburn	Total Acres	Grand Total Reservations and Parkways (Acres)	
	Cities.																						
1	Boston	–	.27	49.58	21.98	–	–	–	–	–	–	–	–	28.80*	50.67	–	–	75.59	–	–	226.89	1,046.56	1
2	Cambridge	86.21	–	–	–	12.40	–	–	–	–	–	–	–	–	–	–	–	–	–	–	98.61	322.59	2
3	Chelsea	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	21.16	–	–	–	21.16	21.16	3
4	Everett	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	31.14	–	–	–	31.14	31.14	4
5	Lynn	–	–	–	–	–	–	–	–	.93	–	–	.32	–	–	–	–	–	–	–	1.25	20.84	5
6	Malden	–	–	–	–	–	–	–	–	–	23.58	–	–	–	–	–	–	–	–	–	23.58	83.11	6
7	Medford	–	–	–	–	–	–	–	–	–	45.01	278.82	–	–	–	–	8.10	–	–	–	331.93	1,337.98	7
8	Melrose	–	–	–	–	–	–	–	14.29	–	–	–	–	–	–	–	–	–	–	–	14.29	194.48	8
9	Newton	–	–	–	–	–	–	117.46	–	–	–	–	–	–	–	–	–	–	–	–	117.46	309.34	9
10	Quincy	–	–	–	–	–	101.12	–	–	–	–	–	–	–	2.72	–	–	–	–	–	103.84	2,707.15	10
11	Revere	–	–	–	–	–	–	–	–	7.72	–	–	–	–	–	–	67.22	–	8.61	–	83.55	147.84	11
12	Somerville	10.00	–	–	–	–	–	–	–	–	11.83	4.95	–	–	–	–	–	–	–	–	26.78	32.69	12
13	Waltham	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	81.48	13
14	Woburn	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	22.63	22.63	22.63	14
	Towns.																						
15	Arlington	28.10	–	–	–	–	–	–	–	–	–	17.01	–	–	–	–	–	–	–	–	45.11	52.94	15
16	Belmont	20.43	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	20.43	35.98	16
17	Braintree	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	69.75	17
18	Brookline	–	–	2.96	–	–	–	75.04	–	–	–	–	–	–	–	–	–	13.66	–	–	91.66	91.66	18
19	Canton	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	836.10	19
20	Dedham	–	–	–	15.16	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	15.16	256.21	20
21	Dover	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	21
22	Hingham	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	22
23	Hull	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	25.59	23
24	Milton	–	83.31	–	–	–	–	–	–	–	–	–	–	51.44	–	–	–	–	–	–	134.75	1,959.62	24
25	Nahant	–	–	–	–	–	–	–	–	–	–	–	66.22	–	–	–	–	–	–	–	66.22	66.22	25
26	Needham	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	14.24	26
	(Randolph)	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	885.25	
27	Saugus	–	–	–	–	–	–	–	25.91	–	–	–	–	–	–	–	–	–	–	–	25.91	557.96	27
28	Stoneham	–	–	–	–	–	–	–	.15	–	–	–	–	–	–	–	–	–	–	–	.15	705.56	28
29	Swampscott	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	3.10	29
30	Wakefield	–	–	–	–	–	–	–	–	–	–	–	–	–	–	15.54	–	–	–	–	15.54	103.02	30
31	Watertown	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	80.95	31
32	Wellesley	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	70.65	32
33	Weston	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	152.52	33
34	Westwood	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	6.57	34
35	Weymouth	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	35
36	Winchester	–	–	–	–	–	–	–	–	–	–	48.28	–	–	–	–	–	–	–	.60	48.88	310.81	36
37	Winthrop	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	.13	–	.13	16.96	37
		144.74	83.58	52.54	37.14	12.40	101.12	192.50	40.35	8.65	80.42	349.06	66.54	80.24	53.39	15.54	127.62	89.25	8.74	23.23	1,567.05	12,660.65	

*Includes East Milton St. from Wolcott Square to Paul's Bridge.

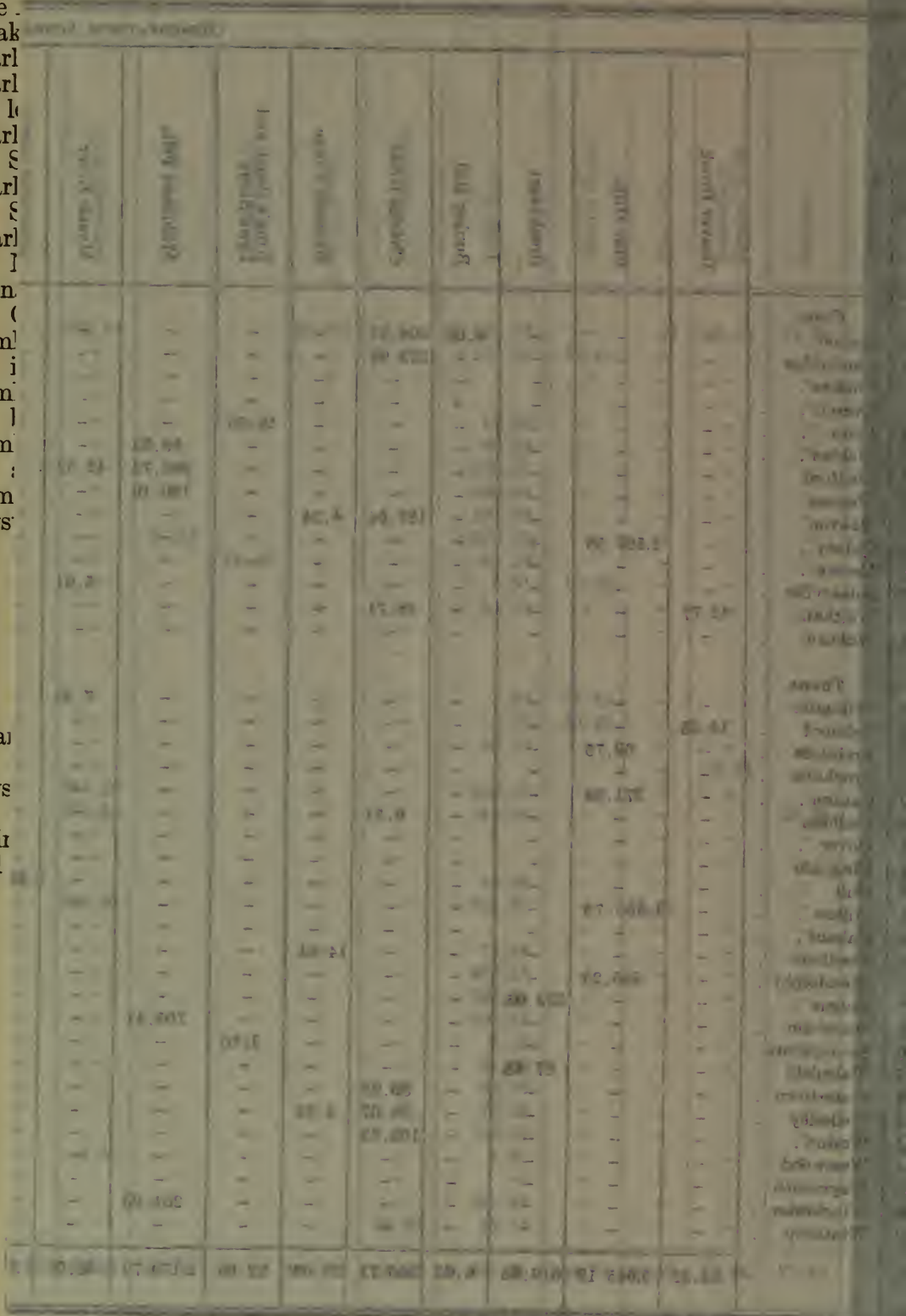


TABLE 3. — *Metropolitan Park System — Mileage of Roadways — December 31, 1936.*

		Alewife Brook Parkway	Blue Hills Parkway		Blue Hills Res.	Veterans of Foreign Wars Parkway	Charles River Res.		Dedham Parkway	East Milton Street		Fresh Pond Parkway	Furnace Brook Parkway	Hammond Pond Parkway	Lynn Fells Parkway	Lynn Shore Res.	Lynnway	Memorial Drive		Middlesex Fells Parkway		Middlesex Fells Res.		Mystic Valley Parkway		Nahant Beach Parkway	Nantasket Beach Res.	Neponset River Parkway	Old Colony Boulevard	Quannapowitt Parkway	Quincy Shore Res.	Revere Beach Parkway		Revere Beach Res.	Stony Brook Res.	West Roxbury Parkway	Winthrop Parkway	Winthrop Shore Res.	Woburn Parkway	Total Miles		Grand Total Miles	
			Double	Single		Double	Double	Single		Double	Single							Double	Single	Double	Single	Double	Single	Double	Single							Double	Single							Double Roadway	Single Roadway		
	Cities.																																										
1	Boston	–	–	.02	–	2.44	.70	5.01	.49	.21	.30	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	.52	2.85	–	–	–	–	–	3.57	2.07	–	–	–	3.35	14.83	21.53	1
2	Cambridge	1.31	–	–	–	–	–	.13	–	–	–	.52	–	–	–	–	–	1.14	2.42	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	1.14	4.38	6.66	2
3	Chelsea	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	.32	.47	–	–	–	–	.32	.47	1.11	3
4	Everett	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	.64	1.12	–	–	–	–	.64	1.12	2.40	4
5	Lynn	–	–	–	–	–	–	–	–	–	–	–	–	–	–	1.04	.12	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	1.16	1.16	5
6	Malden	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	1.02	.70	–	.74	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	1.02	1.44	3.48	6
7	Medford	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	2.65	.22	.40	3.60	.96	3.32	–	–	–	–	–	–	–	–	–	.47	–	–	–	–	4.01	7.61	15.63	7
8	Melrose	–	–	–	–	–	–	–	–	–	–	–	–	–	1.90	–	–	–	–	–	–	–	1.04	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	2.94	2.94	8
9	Newton	–	–	–	–	–	–	2.67	–	–	–	–	–	1.14	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	3.81	3.81	9
10	Quincy	–	–	–	5.06	–	–	–	–	–	–	–	3.37	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	.31	–	2.44	–	–	–	–	–	–	–	–	–	11.18	11.18	10
11	Revere	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	.57	–	–	–	–	–	–	–	–	–	–	–	–	–	–	.53	2.21	2.70	–	–	.89	–	–	.53	6.37	7.43	11
12	Somerville	.93	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	.34	.48	–	–	–	.38	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	.34	1.79	2.47	12
13	Waltham	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	13
14	Woburn	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	1.31	–	1.31	1.31	14
	Towns.																																										
15	Arlington	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	1.46	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	1.46	1.46	15
16	Belmont	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	16
17	Braintree	–	–	–	.39	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	.39	.39	17
18	Brookline	–	–	–	–	.27	–	–	–	–	–	–	–	.78	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	1.28	–	–	–	.27	2.06	2.60	18
19	Canton	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	19
20	Dedham	–	–	–	–	–	–	–	.49	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	.49	.49	20
21	Dover	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	21
22	Hingham	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	22
23	Hull	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	.71	–	–	–	–	–	–	–	–	–	–	–	–	.71	.71	23
24	Milton	–	1.41	1.46	5.26	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	.53	–	–	–	–	–	–	–	–	–	–	1.41	7.25	10.07	24
25	Nahant	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	1.94	–	–	–	–	–	–	–	–	–	–	–	–	–	–	1.94	1.94	25
26	Needham	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	26
27	Saugus	–	–	–	–	–	–	–	–	–	–	–	–	–	1.71	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	1.71	1.71	27
28	Stoneham	–	–	–	–	–	–	–	–	–	–	–	–	–	.02	–	–	–	–	–	–	–	5.85	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	5.87	5.87	28
29	Swampscott	–	–	–	–	–	–	–	–	–	–	–	–	–	–	.08	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	.08	.08	29
30	Wakefield	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	.68	–	–	–	–	–	–	–	–	–	–	.68	.68	30
31	Watertown	–	–	–	–	–	–	1.74	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	1.74	1.74	31
32	Wellesley	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	32
33	Weston	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	33
34	Westwood	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	34
35	Weymouth	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	35
36	Winchester	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	1.31	–	1.81	–	–	–	–	–	–	–	–	–	–	–	–	–	–	.07	–	3.19	3.19	36
37	Winthrop	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	37
	Single Roadway	2.24	–	1.48	10.71	–	–	9.55	.98	–	.30	.52	3.37	1.92	3.63	1.12	.69	–	2.42	–	1.40	–	12.54	–	6.97	1.94	.71	1.05	3.16	.68	2.44	–	4.27	2.70	3.57	3.35	1.09	1.07	1.38	–	87.25		
	Double Roadway	–	1.41	–	–	2.71	.70	–	–	.21	–	–	–	–	–	–	–	1.14	–	4.01	–	.40	–	.96	–	–	–	–	–	–	–	1.49	–	–	–	–	–	–	–	13.03*	–	113.31	

*Equivalent in miles of single roadway—26.06 miles.

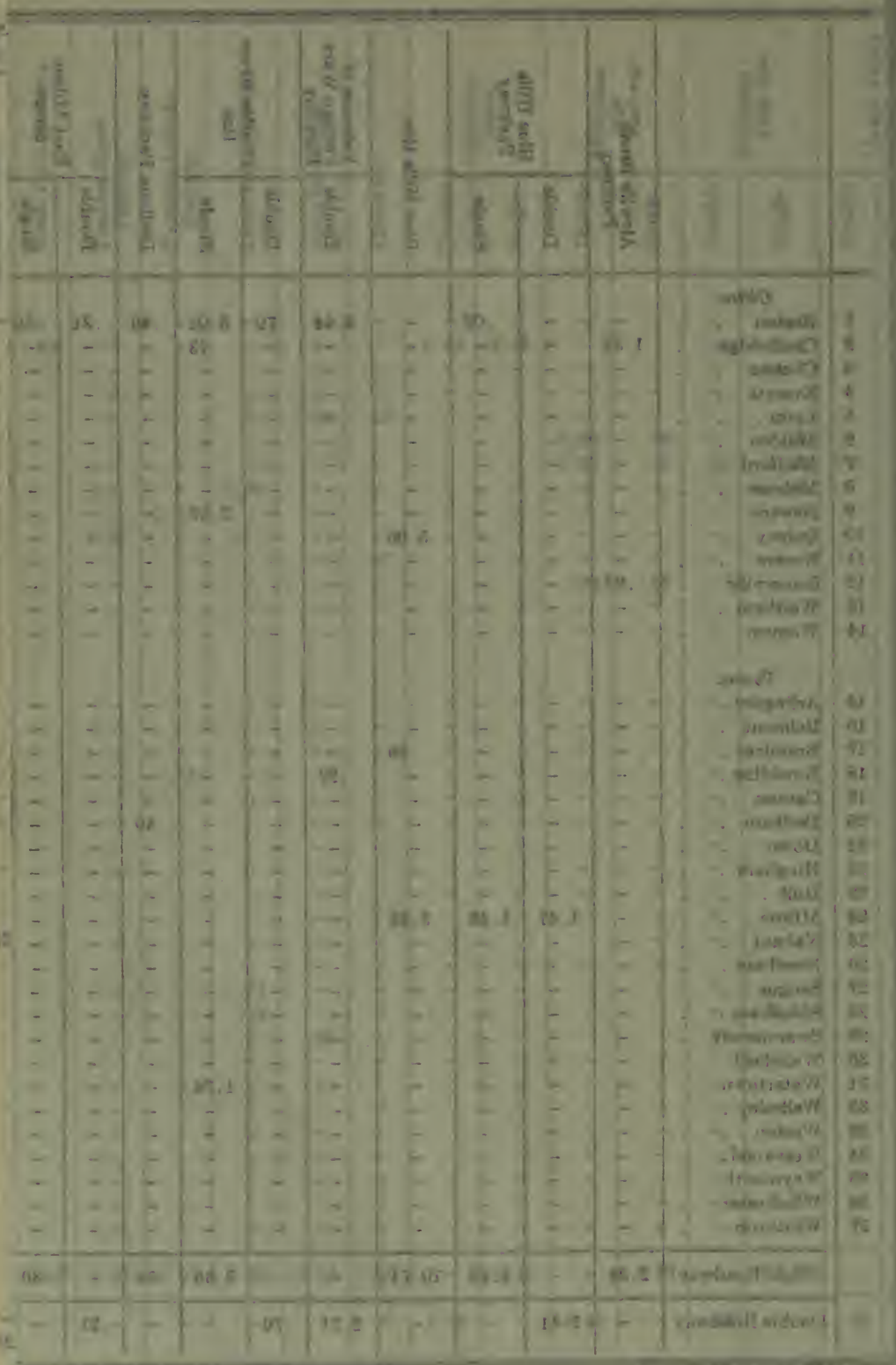


Table 9

Contracts Made and Pending During

Contract Number	WORK	Number of Bids	Lowest
	National Industrial Recovery Project Mass. State D-1, P.W.A. Docket No. 4478. Furnishing and installing lighting standards, cables and other materials on the Wellington Bridge in Somerville and Medford	4	$4,474.00
249	Furnishing foremen, carpenters, painters, painters rigger, pavers, concrete workers and laborers for work on maintenance of bridges under the care and control of this commission for the balance of the current calendar year 1936	15	58.23 (labor group)
250	Repairs to Harvard Bridge (painting) Boston and Cambridge	6	17,450.00
251	Bathhouse on the westerly side of Old Colony Parkway, Malibu Beach, Boston, Dorchester District	9	64,846.00
252	Widening of driveway at Metropolitan District Commission Police Station, Charles River Reservation, Lower Basin	12	2,360.00
253	Regrading and resurfacing sections of Lynn Fells Parkway between Melrose Street and Main Street near Lincoln Street, Melrose and regrading and resurfacing section of Wyoming Avenue from Fellsway East Extension to Melrose line in the Middlesex Fells Reservation, Stoneham	4	9,947.00
254	Reconstruction of Chickatawbut Road, Blue Hills Reservation, Milton and Quincy, from Unquity Road to Randolph Avenue and of Hillside Street, Blue Hills Reservation, Milton, from Chickatawbut Road, 3,600 feet southwesterly	8	119,905.00
255	Regrading and resurfacing deck and approaches of the Larz Anderson Bridge over the Charles River in Boston and Cambridge	9	1,800.00
256	Reconstructing Soldiers Field Road from Western Avenue to North Harvard Street in the Brighton District of Boston	11	27,343.00
257	Reconstructing a section of Charlesbank Road between Embankment Road and Charles Street, Boston	6	3,800.00
258	Grading Broadway overpass on Revere Beach Parkway in Revere	7	15,115.50
259	Constructing Bridge and approaches over the Mystic River in Medford and Arlington	14	71,786.00
260	Dredging in Charles River at Faneuil Valley Brook Drain Outlet, Brighton District, Boston	7	1,850.00
261	Reconstruction of Easterly Roadway, Middlesex Fells Parkway, Medford, from Riverside Avenue to Medford Branch, Boston and Maine Railroad	11	23,506.00
262	Placing a one inch bituminous concrete seal coat on The Veterans of Foreign Wars Parkway, Boston and Brookline	11	26,865.00
263	Repairs to sea wall and steps, Washington Street to Humphrey Street, Lynn Shore Reservation, Lynn and Swampscott	12	8,537.50
264	Repairs to large Boat Lock and Gates, Charles River Dam, Boston	4	24,265.00
265	Dredging in Mystic River in various areas between the Mystic Lakes and the Auburn Street Bridge, Medford, Somerville and Arlington	6	4,410.00
	National Industrial Recovery Project Mass. State D-1, P.W.A. Docket No. 4478. Furnishing sodium lamps, fixtures and operating equipment on the Wellington Bridge in Somerville and Medford	4	1,588.10
266	Placing a one inch bituminous concrete seal coat on Lynn Fells Parkway from Fellsway East Extension to Tremont Street, Stoneham and Melrose	8	4,285.00
267	Reconstruction of a portion of Memorial Drive from Mount Auburn Street about 600 feet southerly, Cambridge	8	4,924.00
268	Placing gravel fill and stone ballast along bulkhead line, Recreation Grounds, Lynn Harbor, Lynn and Nahant	7	8,435.00
269	Furnishing and installing a permanent flood lighting system for the Charles River Lagoon, Boston	5	1,545.00
270	Regrading and resurfacing a section of Old Colony Parkway from a point south of Tolman Street to a point near Freeport Street in the Dorchester District of Boston	8	10,725.00
271	Replacing cast iron fence and repairing concrete wall at the Speedway Headquarters near the Arsenal Street Bridge, in the Brighton District of Boston	5	927.00
272	Concrete, granite masonry and riprap repairs to Blacks Creek Dam, Quincy Shore Boulevard, Quincy	8	537.00
273	Constructing retaining wall southerly side of Nonantum Road, Newton, about 600 feet west of Charlesbank Road.	21	2,942.60
274	Reconstructing dike at southwesterly side of Watertown Dam, Watertown	10	845.00
275	Bathhouse on the southerly side of Pleasant Street about 700 feet east of Green Street on the Charles River, Watertown	10	51,213.00
276	Steel repairs to Winthrop Shore Bridge, Winthrop Shore Reservation, Winthrop	5	1,500.00
277	Constructing wooden boat landing and reinforced concrete and granite steps and balustrades on the northerly side of the Charles River, near Watertown Square, Watertown	16	9,475.00
278	Construction of proposed bathing beach on the southerly side of Pleasant Street about 700 feet east of Green Street on Charles River, Watertown	14	17,189.50

*Second lowest bidder.

Table 9

THE YEAR 1936 — PARKS DIVISION

Contractor	Date of Contract	Date of Completion	Value of work done Dec. 31, 1936
Hixon Electric Co.	Feb. 27, 1936	–	$3,389.18
Carroll Construction Company	Bids rejected	–	–
Maurice M. Devine	July 9, 1936	Oct. 13, 1936	18,445.00
G. L. & C. Company	July 23, 1936	–	55,392.00
Dooley Bros. Inc.	July 9, 1936	Aug. 11, 1936	2,360.00
Simpson Bros. Corp.	July 30, 1936	Sept. 10, 1936	12,870.00
A. G. Tomasello & Son, Inc.	July 23, 1936	–	120,655.00
Vulcan Construction Company	July 23, 1936	Aug. 1, 1936	1,800.00
John P. Condon Corp.	July 30, 1936	Aug. 25, 1936	27,616.00
Martino De Matteo	Aug. 6, 1936	Sept. 9, 1936	3,890.25
Peter F. Ahearn	Aug. 20, 1936	Nov. 16, 1936	19,369.29
Coleman Bros. Corp.	Sept. 3, 1936	–	44,287.00
H. L. Hauser Bldg. Co., Inc.	Sept. 3, 1936	Oct. 15, 1936	2,948.05
John P. Condon Corp.	Aug. 27, 1936	Oct. 31, 1936	24,415.00
National Contractors Company	Sept. 3, 1936	Oct. 12, 1936	26,865.00
A. R. Doyle, Inc.	Sept. 3, 1936	–	9,929.50
J. A. Singarella Construction Corp.	Oct. 1, 1936	Nov. 23, 1936	32,609.15
Lee Construction Co., Inc.	Sept. 10, 1936	Nov. 19, 1936	11,199.51
Kenworthy & Taylor, Inc.	Sept. 24, 1936	–	1,228.97
Simpson Bros. Corp.	Sept. 24, 1936	Oct. 5, 1936	4,465.00
Samuel J. Tomasello Corp.	Sept. 24, 1936	Oct. 15, 1936	5,251.94
M. McDonough Corp.	Oct. 15, 1936	–	9,816.60
Kenworthy & Taylor	Oct. 15, 1936	Dec. 26, 1936	1,545.00
National Contractors Company	Oct. 15, 1936	–	9,378.48
J. A. Singarella Construction Corp.	Oct. 22, 1936	–	–
Lee Construction Co., Inc.	Oct. 29, 1936	–	911.00
Dooley Bros., Inc	Nov. 12, 1936	–	2,000.00
Coleman Bros. Corp.	Nov. 12, 1936	–	–
Vincent Caira	No action taken	–	–
M. F. Gaddis Inc.*	Nov. 19, 1936	Dec. 17, 1936	1,675.00
Maurice M. Devine	Dec. 17, 1936	–	–
Lee Construction Co., Inc.	No action taken	–	–

Miscellaneous Data Relative To the Development and Patronage of the Park and Recreational Facilities of the Parks Division During the Fiscal Year of 1936

Park Buildings

Type	Total No.	No. Persons Served	Const. During 1936
Bath Houses	12	199,676	1
Boat Houses	4	144,000	0
Refreshment Stands	25	998,000	2
Administration Bldgs.	10	–	0
Barns	12	–	2-Gifts
Comfort Stations	29	–	2
Dwelling Houses	25	–	2-Gifts
Garages	17	–	1
Greenhouses	1	–	0
Shelters	83	–	1
Work Shops	16	–	1

Park Development During 1936

Type of Work Done	Number
Areas Graded (in acres)	430
Areas Planted (in acres)	374
Auto Parks Const. (in acres)	17
Bridle Trails Const. (in miles)	14
Bulbs Planted	1,500
Parkways Const. (in miles)	3½
Plants Set Out	1,919
Roads Const. (in miles)	4
Sea Walls Const. (in linear feet)	867
Shrubs Planted	7,901
Trees Planted:	
Parkways	1,006
Woodland	20,000
Trees Sprayed:	
Bridle Paths (in miles)	10
Parkways	1,722
Roadside (in miles)	80
Woodland (in acres)	1,505
Trees Trimmed:	
Bridle Paths (in miles)	5
Parkways	2,335
Woodland (in acres)	10
Walks Const.:	
Bituminous (in miles)	5 4/5
Gravel (in miles)	3¼

Special Recreation Facilities

Type	Total No.	No. Active Participants During Year	Cons Durir 1936
Athletic Fields (Track)	2	3,500	–
Band Stands	12	2,375	–
Baseball Diamonds	12	19,456	6
Bathing Beaches	18	26,995,000	1
Boy Scout Trails	1	800	–
Bridle Trails	179	30,500	16
Children's Playgrounds	9	161,000	1
Dance Pavilions	2	2,000	–
Golf Courses — 18 Hole	2	38,074	–
Ice Skating Areas	19	493,000	1
Nature Trails	43	19,000	3
Outdoor Fireplaces	21	31,000	14
Picnic Centers with drinking water	15	95,000	3
Picnic Centers without drinking water	12	44,500	1
Ski Jumps	1	500	–
Ski Trails	4	–	4
Swimming Pools —Outdoor	1	6,000	–
Tennis Courts	16	86,500	2
Toboggan Slides	2	20,000	–

Spot Pond Zoo
Middlesex Fells Reservation

Total Number of Acres	
Number of Buildings	
Number of Cages	3
Number of Mammals	16
Number of Birds	34
Number of Reptiles	2
Total Number of Specimens	53
Total Number of Visitors	156,000

Appendix No. 3

Statistics of Police Department

Miscellaneous Work Done by the Department

Accidents reported	1,994
Assistance rendered other departments	201
Buildings found open and made secure	87
Cases investigated	985
Dead bodies found	34
Defective street lamps reported	1,134
Defective sidewalks reported	35
Defective streets reported	102
Fire alarms given	64
Fires extinguished without alarms	89
Injured and sick persons assisted	1,847
Insane persons cared for	16
Lost children restored	886
Rescued from drowning	86
Water running to waste reported	17
Street obstructions removed	4
Vessels assisted to anchorage	9
Assistance rendered to U. S. Coast Guard	2
Number of cases before the courts	2,366

List of Offences

Adultery	1
Assault and Battery	49
Assault and Battery on a police officer	3
Attempt to rescue a prisoner	1
Assuming to be a police officer	1
Breaking and entering and larceny	10
Breaking and entering in the night time	10
Burglary	1
Concealed weapons	1
Default warrants	30
Delinquent	30
Disturbing the peace	7
Drunkenness	675
Defacing property	5
For other police departments	4
Illegal possession of firearms	2
Indecent exposure	3
Larceny	28
Larceny, attempt	4
Larceny of auto	14
Larceny of check	1
Being abroad in the night time	1
Kidnapping and extortion	1
Larceny from the person	2
Lewdness	8
Lottery, setting up	1
Manslaughter	7
Non-support	4
Night Walker	1
Profanity	1
Rape	1
Robbery, armed	4

Robbery, S. P.	
Runaways	
Suspicious persons	
Stolen property in possession	
Trespass	
Unnatural Acts	
Using boat without authority	
Vagrancy	
Violation True Name Law	
Violation of probation	2

Offences Against the Motor Vehicle Laws

Allowing another to use auto license	
Allowing improper person to operate	
Failing to stop at through way	7
Failing to stop for police officer	
Failing to slow down at intersection	6
Failing to stop for red light	2
Faulty brakes	
Failing to slow down for pedestrian	
Giving false name	
Improper lights	2
Leaving scene of accident without making self known	4
Not duly licensed	9
No license in possession	3
No registration in possession	2
No registration plates	
Operating while under the influence of intoxicating liquor	15
Operating so as the lives and safety of the public might be endangered	11
Operating after revocation of license	1
Operating after revocation of registration	
Operating uninsured motor vehicle	1
Operating unregistered motor vehicle	1
Operating motor vehicle without authority	2
Operating motor vehicle at a speed greater than reasonable	1
Obscure plates	
Passing where view was obstructed	
Refusing to stop for police officer	
Refusing to show license	
Using motor vehicle without authority	
Using registration plates issued to another	

Offences against the M. D. C. Rules and Regulations

Violation M.D.C. Rules, General	12
Violation M.D.C. Rules, Auto	10
Violation M.D.C. Rules, Speeding	39

Dispositions of Cases in the Lower Courts

Dismissed	7
Filed	70
Fined	69
Defaulted	1
Committed to House of Correction	6
Committed to State Farm	1
Committed to Shirley School	
Appealed	7
Committed to Concord Reformatory	
Committed to Lyman School	
Drunks released	22

Filed, costs of court	102
Fine suspended	37
House of Correction suspended	66
Held for the Grand Jury	14
Turned over to other police departments	68
Discharged	75
No probable cause	1
Suspicious persons, released	8
Cases pending	32

Superior Court Dispositions

Fined	16
House of Correction, suspended	1
Filed	7
Probation	1
Not guilty	19
House of Correction, committed	10
Nol prossed	14
Pending	7

Fines Assessed by the Courts

M.D.C. Rules—General	$410.00
M.D.C. Rules—Motor Vehicle	1,785.00
Motor Vehicle Law P.S.	9,754.00
General Laws	649.00
Drunkenness	630.00
Total	$13,228.00

Appendix No. 4

Contracts Made and Pending During

1 Number of Contract	2 WORK	3 Number of Bids	Amount of Bid		6 Contractor
			4 Next to Lowest	5 Lowest	
104 [1]	Furnishing and laying water pipes in Medford.	9	$195,218.00	$190,226.20 [2]	Coleman Bros. Corp. Boston.
107 [1]	Rock excavation for Intermediate High Service Pipe Line in Arlington and Belmont.	1	–	7,095.00 [2]	John A. Gaffey and Son, Medford, Mass.
109 [1]	Venturi meter tubes and register-indicator-recorders.	– [3]	– [3]	– [3]	Builders Iron Foundry, Providence, R. I.
110 [1]	Furnishing equipment for chlorinating plant at Spot Pond Pumping Station.	– [3]	– [3]	– [3]	Wallace & Tiernan Co., Inc., Newark, N. J.
111	Pumping equipment for Intermediate High Service Pumping Station in Belmont.	7 [4]	8,990.00 [5] and guarantee of 79% efficiency.	8,516.00 and guarantee of 73.5% efficiency.	Turbine Equipment Co. of New England, Boston.
112	Constructing a reinforced concrete covered reservoir in Arlington.	20	55,966.50	53,181.00 [2]	O'Malley and Delaney, Waltham, Mass.
113	Constructing a masonry pumping station in Belmont.	23	18,994.00	18,000.00 [2]	G. L. & C. Co., Boston.
114	Furnishing and laying water pipes in Everett and Chelsea.	9	217,689.75 [2]	198,276.50	V. J. Grande Company, Boston.
115 [1]	Constructing a masonry fish ladder at the Circular Dam on the Quinapoxet River in West Boylston.	5	3,800.00	3,134.00 [2]	R. H. Newell Co., Uxbridge, Mass.

Appendix No. 4

THE YEAR 1936 — WATER DIVISION

7 Date of Contract	8 Date of Completion of Contract	9 Prices of Principal Items of Contract	10 Value of Work done Dec. 31, 1936
May 28, 1935	Dec. 2, 1936	See Annual Report for 1935.	$214,901.32
July 13, 1935	Oct. 6, 1936	See Annual Report for 1935.	10,153.54
Oct. 14, 1935	Apr. 3, 1936	See Annual Report for 1935.	4,100.00
Jan. 11, 1936	Feb. 1, 1936	For two Visible Vacuum Chlorinators, Type M.S.V., with the necessary appurtenances, $2,750; for two Fairbanks Portable Scales with silver-plated beams, $170.	2,920.00
June 16, 1936	–	For the entire equipment including as a part thereof 2 electric motor-driven centrifugal pumping units, each with a pumping capacity of 3 million gallons of water in 24 hours against a head of 162 feet, $8,990.	–[6]
July 21, 1936	–	For top soil or earth excavation, $0.35 per cu. yd.; for rock excavation, $2.50 per cu. yd.; for refill and embankments, $0.10 per cu. yd.; for furnishing and placing loam, $1.25 per cu. yd.; for furnishing Portland cement, $2.15 per bbl.; for concrete in reservoir roof, $12 per cu. yd.; for concrete in columns and capitals, $18.88 per cu. yd.; for other concrete, $10 per cu. yd.	55,562.06
Oct. 14, 1936	–	For the general construction of the building complete, including all trades, in accordance with the plans and specifications, $18,000.	5,818.71
Oct. 14, 1936	–	For furnishing and laying 48-inch and 36-inch electric-welded steel pipes, $18.49 per lin. ft.; for rock excavation above and below and for earth excavation below established grade, $3 per cu. yd.; for concrete masonry for foundations for valve chambers and anchorages for pipes, $7 per cu. yd.; for furnishing and driving spruce piles for foundations, $0.35 per lin. ft.; for furnishing and placing Douglas fir timber for foundations, $100 per M ft. board measure.	18,954.63
Sept. 1, 1936	Oct. 10, 1936	For earth excavation, $1.50 per cu. yd.; for rock excavation, $5.00 per cu. yd.; for 1-2-4 mixture Portland cement concrete, $13.50 per cu. yd.; for Ashlar granite masonry, $118 per cu. yd.	3,503.77

Appendix No. 4

Contracts Made and Pending During

1 Number of Contract	2 WORK	3 Number of Bids	Amount of Bid		6 Contractor
			4 Next to Lowest	5 Lowest	
116 [1]	Cast-iron flanged pipes and fittings.	4	$1,144.03	$1,049.00 [2]	Donaldson Iron Co. Emaus, Pa.
117	Chlorinator at Waban Hill Reservoir.	2	2,395.00 (2% discount 10 days)	2,350.00 [2] (2% discount 10 days)	Hayes Pump & Machinery Co., Boston.
35-M	Sale and purchase of electric energy to be developed at Wachusett Dam in Clinton.	– [3]	– [3]	– [3]	New England Power Co. and The Edison Electric Illuminating Company of Boston.
36-M	Sale and purchase of electric energy to be developed at Sudbury Dam in Southborough.	– [3]	– [3]	– [3]	The Edison Electric Illuminating Co. of Boston.
67-M [1]	Chlorinator at Fisher Hill Reservoir.	– [3]	– [3]	– [3]	Hayes Pump & Machinery Co., Boston.
68-M	Reconstructing Fountain Street Bridge in Framingham.	12	7,910.25	7,701.00 [2]	John A. Gaffey and Son, Medford, Mass.
69-M	New roof for Farm Pond Gatehouse in Framingham.	2	3,165.00	2,343.00 [2]	Byron L. Moore, Framingham, Mass.
70-M	Furnishing and attaching sound-absorbing tile to ceiling of the office of the Superintendent at the Wachusett Dam in Clinton.	2	356.00	210.00 [2]	The McClay Company, Boston.

[1] Contract completed.
[2] Contract based upon this bid.
[3] Competitive bids were not received.
[4] Five bids did not comply with specifications in all respects.
[5] Contract based upon this bid. Efficiency as well as price considered in awarding contract.
[6] Equipment completed at shop but not delivered.

Appendix No. 4

THE YEAR 1936 — WATER DIVISION — Concluded

7 Date of Contract	8 Date of Completion of Contract	9 Prices of Principal Items of Contract	10 Value of Work done Dec. 31, 1936
Aug. 28, 1936	Nov. 9, 1936	For 18,956 lbs. of 20-inch and 12-inch flanged cast-iron pipes and 3,594 lbs. of flanged cast-iron specials for 8-inch, 12-inch and 20-inch pipes, $1,049.	$1,049.00
Nov. 2, 1936	–	For one pitot operating automatic chlorinator, $2,350.	–
Mar. 1, 1929	–	Sale and purchase of all electricity generated after deduction of that used by Commission in connection with the operation of its works in Wachusett Section.	389,642.32
Mar. 1, 1929	–	Sale and purchase of all electricity generated after deduction of that used by Commission in connection with operation of its Sudbury Power Station.	227,027.31
July 20, 1936	July 24, 1936	For No. 350 Pardee automatic proportionating chlorinator.	2,350.00
Nov. 23, 1936	–	For furnishing and erecting structural steel, $0.05 per lb.; for reinforced Portland cement concrete, exclusive of fences, $16 per cu. yd.; for reinforced Portland cement concrete in fences, $58 per cu. yd.; for granolithic sidewalks, $3 per sq. yd.; for bituminous concrete surfacing, Type D, $11 per ton.	–
Nov. 28, 1936	–	For removing the present slate roof and the light steel purlins and constructing a new slate roof, $2,343.	1,443.00
Dec. 23, 1936	–	For furnishing and installing in the office of the Superintendent at the Wachusett Dam in Clinton, Acousti-Celotex, Type Triple B, 12-inch by 12-inch by 1¼-inch White High Light Reflecting Surface Sound-Absorbing Tile, $210.	–

Appendix No. 5

Table No. 1. — *Monthly Rainfall in inches at Various Places on the Metropolitan Water Works, 1936*

	January	February	March	April	May	June	July	August	September	October	November	December	Totals
Wachusett Watershed:													
Princeton	8.77	2.61	10.89	3.81	2.87	3.39	1.79	5.05	4.73	3.11	1.66	8.19	56.87
Jefferson	7.67	3.10	12.05	3.76	4.30	2.33	2.57	5.73	5.30	4.08	1.72	8.41	61.02
Sterling	7.43	2.37	10.74	3.78	3.09	2.94	2.12	5.04	4.59	2.68	1.52	7.98	54.28
Boylston	8.25	3.46	10.46	3.38	3.55	2.71	2.58	5.58	4.21	2.87	1.82	8.17	57.04
Sudbury Watershed:													
Sudbury Dam	8.18	3.96	9.95	3.33	2.48	2.68	0.82	5.16	4.83	2.24	1.66	8.67	53.96
Framingham	7.97	3.91	9.61	3.28	2.10	2.47	1.24	5.16	5.03	2.04	1.64	8.80	53.25
Ashland Dam	8.05	4.33	9.29	3.12	2.63	2.04	1.14	4.94	6.04	1.68	1.65	8.53	53.44
Cordaville	8.22	4.27	9.88	3.38	3.29	2.45	1.50	5.40	6.39	2.41	1.68	8.59	57.46
Lake Cochituate	7.91	4.27	8.94	3.39	2.00	2.46	1.74	4.85	5.07	2.03	1.56	8.64	52.86
Chestnut Hill Reservoir	7.15	3.43	7.10	3.38	1.82	2.05	1.55	6.01	5.45	2.03	1.62	8.31	49.90
Spot Pond	8.21	4.29	7.42	3.42	1.84	2.65	1.46	6.07	5.24	2.02	1.43	9.35	53.41
Average of All	7.98	3.64	9.67	3.46	2.73	2.56	1.68	5.36	5.17	2.47	1.63	8.51	54.86
Average, Wachusett Watershed	8.03	2.89	11.04	3.68	3.45	2.84	2.26	5.35	4.71	3.18	1.68	8.19	57.30
Average, Sudbury Watershed	8.10	4.12	9.68	3.28	2.62	2.41	1.18	5.17	5.57	2.09	1.66	8.65	54.53

TABLE No. 2. — *Rainfall in Inches at Chestnut Hill Reservoir in 1936*

DATE	AMOUNT	DURATION
Jan. 2	1.73	8.00 P.M. to 3.30 P.M.
Jan. 3		
Jan. 4	.72	11.50 P.M. to 9.05 A.M.
Jan. 5		
Jan. 6	.12[1]	4.15 P.M. to 7.50 A.M.
Jan. 7		
Jan. 9	1.04	5.20 P.M. to 3.30 A.M.
Jan. 10		
Jan. 12	.07[2]	1.30 A.M. to 8.30 A.M.
Jan. 13	.09	3.20 P.M. to 5.45 P.M.
Jan. 15	1.80	4.50 P.M. to 12.10 A.M.
Jan. 16		
Jan. 18	.54[2]	6.10 A.M. to 7.30 P.M.
Jan. 19	.95[2]	5.15 A.M. to 4.20 A.M.
Jan. 20		
Jan. 23	.02	1.15 A.M. to 3.30 A.M.
Jan. 27	.07[1]	5.10 A.M. to 5.10 A.M.
Jan. 28		
Total	7.15	
Feb. 3	.48[1]	11.00 P.M. to 8.00 P.M.
Feb. 4		
Feb. 9	.23[2]	11.00 A.M. to 8.00 P.M.
Feb. 13	1.18[2]	9.40 P.M. to 7.30 P.M.
Feb. 14		
Feb. 16	.52	2.40 P.M. to 5.30 P.M.
Feb. 17	.94[1]	12.01 A.M. to 4.05 P.M.
Feb. 18		
Feb. 25	.02	12.15 A.M. to 5.05 A.M.
Feb. 27	.06	2.20 P.M. to 5.00 P.M.
Total	3.43	
Mar. 3	.74[2]	1.00 A.M. to 1.10 P.M.
Mar. 5	.19[2]	6.10 A.M. to 11.30 P.M.
Mar. 9	.03	2.35 P.M. to 11.00 P.M.
Mar. 11	1.34	7.45 A M to 2.10 P.M.
Mar. 12	.91	9.00 P.M. to 11.45 P.M.
Mar. 13	.01	2.05 P.M. to 3.10 P.M.
Mar. 14	.02[2]	1.45 A.M. to 5.45 A.M.
Mar. 18	2.00	12.01 A.M. to 9.15 A.M.
Mar. 19		
Mar. 20	.56	11.30 P.M. to 6.15 A.M.
Mar. 22		
Mar. 24	.35	9.30 P.M. to 5.40 A.M.
Mar. 25		
Mar. 27	.95	9.45 A.M. to 4.30 A.M.
Mar. 28		
Total	7.10	

DATE	AMOUNT	DURATION
Apr. 2	.96[1]	12.10 A.M. to 5.50 A.M.
Apr. 3		
Apr. 5	.66	10.20 P.M. to 3.20 P.M.
Apr. 6		
Apr. 7	.16	12.10 P.M. to 11.15 P.M.
Apr. 9	.38	10.10 P.M. to 10.45 A.M.
Apr. 10		
Apr. 11	.47	12.45 A.M. to 12.15 A.M.
Apr. 12		
Apr. 13	.03	3.30 A.M. to 10.40 A.M.
Apr. 15	.38	3.40 A.M. to 8.00 P.M.
Apr. 21	.23	2.15 A.M. to 11.15 P.M.
Apr. 26	.06	3.15 A.M. to 11.10 A.M.
Apr. 29	.02	1.00 A.M. to 8.10 A.M.
Apr. 30	.03	7.30 A.M. to 9.20 A.M.
Total	3.38	
May 3	1.01	10.30 A.M. to 8.15 P.M.
May 4		
May 7	.01	6.15 A.M. to 7.30 A.M.
May 12	.38	5.50 P.M. to 6.45 P.M.
May 13	.06	8.45 P.M. to 7.20 A.M.
May 14		
May 15	.04	11.30 P.M. to 1.30 A.M.
May 16		
May 17	.11	7.40 A.M. to 1.30 P.M.
May 18	.02	7.30 P.M. to 8.10 P.M.
May 19	.16	3.15 P.M. to 10.00 P.M.
May 27	.03	4.00 P.M. to 5.10 P.M.
Total	1.82	
June 12	.16	4.45 A.M. to 1.10 P.M.
June 13	.24	9.45 A.M. to 9.00 P.M.
June 14	1.25	7.15 A.M. to 12.15 A.M.
June 16		
June 18	.17	7.45 P.M. to 3.30 A.M.
June 19		
June 21	.02	12.30 A.M. to 6.35 A.M.
June 24	.17	3.40 A.M. to 11.10 P.M.
June 27	.04	5.05 A.M. to 8.10 A.M.
Total	2.05	
July 5	.56	6.00 P.M. to 8.45 P.M.
July 9	.38	2.30 A.M. to 4.50 A.M.
July 9	.11	7.00 P.M. to 5.15 A.M.
July 10		
July 11	.20	3.00 A.M. to 7.30 A.M.
July 18	.04	8.20 P.M. to 9.55 P.M.
July 20	.15	3.50 P.M. to 8.05 P.M.
July 24	.08	3.00 P.M. to 11.30 P.M.
July 25	.02	10.10 P.M. to 10.45 P.M.
July 29	.01	4.00 P.M. to 4.20 P.M.
Total	1.55	

[1] Snow and Rain.
[2] Snow.

Table No. 2. — *Rainfall in Inches at Chestnut Hill Reservoir in 1936* — Concluded

Date	Amount	Duration
Aug. 4	.50	5.15 P.M. to 7.00 P.M.
Aug. 5	.02	8.00 P.M. to 8.30 P.M.
Aug. 6	.68	7.15 A.M. to 6.10 P.M.
Aug. 13	.01	6.05 P.M. to 7.00 P.M.
Aug. 14	.01	4.10 P.M. to 5.30 P.M.
Aug. 15	.02	3.30 P.M. to 4.05 P.M.
Aug. 17	.29	11.45 A.M. to 3.45 P.M.
Aug. 20	.41	5.10 A.M. to 7.10 A.M.
Aug. 21	1.35	6.10 P.M. to
Aug. 22		6.45 A.M.
Aug. 23	.03	10.15 A.M. to 11.30 A.M.
Aug. 26	.07	12.10 A.M. to 4.30 A.M.
Aug. 29	2.62	5.10 A.M. to
Aug. 30		4.45 A.M.
Total	6.01	
Sept. 2	.17	3.20 P.M. to
Sept. 3		4.00 P.M.
Sept. 8	.09	12.30 A.M. to 4.30 P.M.
Sept. 12	.17	6.10 P.M. to 8.20 P.M.
Sept. 18	3.59	9.30 A.M. to
Sept. 19		7.30 A.M.
Sept 21	.11	4.00 A.M. to 5.15 A.M.
Sept 24	.13	9.40 P.M. to
Sept. 25		1.45 A.M.
Sept. 28	.01	1.05 A.M. to 1.15 A.M.
Sept. 30	1.18	8.45 A.M. to
Oct. 1		7.00 A.M.
Total	5.45	
Oct. 1	.46	7.00 A.M. to 11.30 A.M.
Oct. 7	.02	2.30 P.M. to 4.00 P.M.
Oct. 10	.04	7.10 A.M. to 3.50 P.M.
Oct. 16	.03	1.50 A.M. to 2.00 A.M.
Oct. 17	1.15	3.45 A.M. to
Oct. 18		3.20 A.M.
Oct. 22	.02	8.50 A.M. to 1.10 P.M.
Oct. 23	.23	12.00 N'N to
Oct. 24		6.50 A.M.
Oct. 26	.08	6.50 A.M. to 4.15 P.M.
Total	2.03	

Date	Amount	Duration
Nov. 2	.02	5.30 A.M. to 6.00 A.M.
Nov. 4	.56	7.10 A.M. to
Nov. 5		7.10 A.M.
Nov. 8	.42	3.45 P.M. to 12.00 MID.
Nov. 14	.12	11.00 A.M. to
Nov. 15		4.40 A.M.
Nov. 18	.02[1]	5.10 A.M. to 6.15 A.M.
Nov. 20	.01	2.15 P.M. to 3.00 P.M.
Nov 24	.35[2]	3.30 A.M. to 11.45 A.M.
Nov. 25	.06	7.50 P.M. to 11.20 P.M.
Nov 28	.06	1.30 P.M. to 6.00 P.M.
Total	1.62	
Dec. 2	1.12	3.40 P.M. to
Dec. 3		2.15 A.M.
Dec 4	.01	1.15 A.M. to 7.05 A.M.
Dec. 6	.72	2.00 P.M. to
Dec. 7		5.00 A.M.
Dec. 10	1.62	2.15 A.M. to 9.30 P.M.
Dec. 11	1.93	10.45 A.M. to
Dec. 13		7.10 A.M.
Dec. 17	.69	12.30 A.M. to 5.30 A.M.
Dec. 19	1.75	11.10 P.M. to
Dec. 20		10.10 A.M.
Dec. 25	.13	10.00 P.M. to
Dec. 26		5.45 A.M.
Dec. 30	.34	3.15 A.M. to
Dec. 31		8.30 P.M.
Total	8.31	

[1] Snow and Rain.
[2] Snow.

Total for the year, 49.90.

TABLE No. 3. — *Wachusett System — Statistics of Flow of Water, Storage and Rainfall in 1936*

(Watershed above dam = 108.84 square miles)

Month	Gallons per Day											Rainfall (Inches)	Rainfall Collected (Inches)	Percentage of Rainfall Collected
	Taken[1] by Town of Clinton	Taken by City of Worcester	Received from Ware River Watershed	Received[2] from City of Worcester Watershed	Discharged[3] into Wachusett Aqueduct	Wasted into River below Dam	Seepage[4] through the North Dike	Storage[5] Gain	Storage[5] Loss	Total Yield of Watershed	Yield per Square Mile			
January	200,000	–	32,061,000	–	103,196,000	1,755,000	800,000	127,742,000	–	201,632,000	1,853,000	8.03	3.304	41.2
February	–	–	–	–	103,541,000	1,676,000	800,000	–	13,541,000	92,476,000	850,000	2.89	1.418	49.1
March	–	–	67,064,000	32,442,000	80,742,000	387,710,000	916,000	401,103,000	–	770,965,000	7,083,000	11.04	12.635	114.5
April	–	–	–	17,584,000	125,114,000	176,285,000	1,001,000	–	2,257,000	282,559,000	2,596,000	3.68	4.475	121.5
May	3,000	–	–	4,248,000	140,139,000	13,429,000	1,000,000	–	13,068,000	137,255,000	1,261,000	3.45	2.249	65.1
June	–	–	–	–	144,637,000	2,073,000	1,000,000	–	90,053,000	57,657,000	530,000	2.84	0.914	32.2
July	10,000	–	–	–	154,203,000	1,683,000	971,000	–	123,935,000	32,932,000	303,000	2.26	0.540	23.8
August	581,000	–	–	–	145,248,000	1,722,000	910,000	–	109,658,000	38,803,000	357,000	5.35	0.636	11.9
September	872,000	–	–	–	124,184,000	1,764,000	882,000	–	91,000,000	36,702,000	337,000	4.71	0.583	12.4
October	810,000	–	–	–	127,022,000	1,655,000	800,000	–	67,045,000	63,242,000	581,000	3.18	1.037	32.5
November	793,000	–	–	–	106,497,000	1,697,000	800,000	–	65,107,000	44,680,000	411,000	1.68	0.709	42.2
December	519,000	–	114,213,000	574,000	63,616,000	1,771,000	826,000	296,316,000	–	248,261,000	2,281,000	8.19	4.069	49.7
Total												57.30	32.569	
Av. for Yr.	317,000	–	18,070,000	4,596,000	118,183,000	49,720,000	892,000	21,875,000	–	168,321,000	1,547,000	–	–	56.8

[1] For water supply of Clinton and Lancaster.
[2] Received from City of Worcester watershed, not included in Wachusett watershed yield.
[3] Including 245,000 gallons per day drawn from aqueduct for supply of Westborough State Hospital.
[4] Estimated.
[5] Aggregate storage in Wachusett Reservoir and in ponds and mill reservoirs.

TABLE NO. 4. — *Sudbury System — Statistics of Flow of Water, Storage and Rainfall in 1936*

(Watershed = 75.2 square miles)

MONTH	GALLONS PER DAY													
	Water* received from Wachusett Reservoir	Water discharged through Sudbury Aqueduct	Water discharged through Weston Aqueduct	Water used by Framingham Water Works	Water diverted from Watershed by Sewers, etc.	Water wasted from Farm Pond	Water wasted into River below Lowest Dam	STORAGE		Total Yield of Watershed	Yield per Square Mile	Rainfall (Inches)	Rainfall Collected (Inches)	Percentage of Rainfall Collected
								Gain	Loss					
January	102,977,000	23,065,000	107,468,000	1,458,000	848,000	16,000	89,135,000	1,013,000	–	120,026,000	1,596,000	8.10	2.847	35.1
February	103,328,000	24,059,000	112,144,000	1,445,000	945,000	138,000	61,524,000	–	35,493,000	61,434,000	817,000	4.12	1.363	33.1
March	80,516,000	17,484,000	104,490,000	1,400,000	2,436,000	1,613,000	408,674,000	31,390,000	–	486,971,000	6,476,000	9.68	11.551	119.3
April	124,887,000	15,124,000	105,270,000	1,252,000	1,916,000	1,742,000	184,026,000	–	9,473,000	174,970,000	2,327,000	3.28	4.011	122.4
May	139,890,000	20,123,000	108,123,000	1,348,000	1,000,000	103,000	42,990,000	27,255,000	–	61,052,000	812,000	2.62	1.448	55.2
June	144,380,000	24,870,000	115,307,000	1,637,000	466,000	–	14,900,000	1,403,000	–	14,203,000	189,000	2.41	0.326	13.5
July	153,932,000	28,177,000	114,132,000	1,665,000	326,000	–	3,532,000	–	990,000	–7,090,000	–94,000	1.18	–0.168	–14.3
August	144,977,000	25,913,000	113,416,000	1,661,000	336,000	–	2,548,000	1,997,000	–	894,000	12,000	5.17	0.021	0.4
September	123,928,000	22,595,000	106,442,000	1,391,000	413,000	–	11,474,000	–	266,000	18,121,000	241,000	5.57	0.417	7.5
October	126,771,000	21,561,000	106,132,000	1,448,000	484,000	–	20,396,000	2,913,000	–	26,158,000	348,000	2.09	0.620	29.6
November	106,247,000	19,753,000	107,174,000	1,413,000	407,000	–	28,813,000	–	29,103,000	22,210,000	295,000	1.66	0.510	30.8
December	63,374,000	21,596,000	109,635,000	1,281,000	1,590,000	–	141,155,000	3,794,000	–	215,677,000	2,868,000	8.65	5.116	59.2
Total												54.53	28.062	
Av. for Yr.	117,938,000	22,033,000	109,135,000	1,450,000	932,000	300,000	84,466,000	–	174,000	100,204,000	1,332,000			51.5

*Not including 245,000 gallons per day drawn from Wachusett Aqueduct for the supply of the Westborough State Hospital, not discharged into Sudbury Reservoir.

TABLE No. 5. — *Cochituate System — Statistics of Flow of Water, Storage and Rainfall in 1936.*

(Watershed of Lake = 17.58 square miles)

Month	Gallons per Day							Rainfall (Inches)	Rainfall Collected (Inches)	Percentage of Rainfall Collected
	Water received from Sudbury Aqueduct	Water diverted from Watershed by Sewers, etc.	Water wasted at Outlet of Lake	Storage		Total Yield of Watershed	Yield per Square Mile			
				Gain	Loss					
January	–	906,000	20,526,000	3,823,000	–	25,255,000	1,437,000	7.91	2.562	32.4
February	–	807,000	22,855,000	–	7,569,000	16,093,000	915,000	4.27	1.528	35.8
March	–	2,987,000	89,461,000	9,368,000	–	101,816,000	5,792,000	8.94	10.331	115.6
April	–	2,360,000	34,307,000	658,000	–	37,325,000	2,123,000	3.39	3.660	108.0
May	–	1,032,000	9,181,000	1,771,000	–	11,984,000	682,000	2.00	1.216	60.8
June	–	303,000	–	2,844,000	–	3,147,000	179,000	2.46	0.309	12.6
July	–	6,000	1,703,000	–	2,077,000	–368,000	–21,000	1.74	–0.037	–2.1
August	–	19,000	–	2,394,000	–	2,413,000	137,000	4.85	0.245	5.0
September	–	666,000	12,985,000	–	6,341,000	7,310,000	416,000	5.07	0.719	14.2
October	–	568,000	4,087,000	1,135,000	–	5,790,000	329,000	2.03	0.587	28.9
November	–	323,000	7,907,000	–	3,390,000	4,840,000	275,000	1.56	0.475	30.5
December	–	1,590,000	39,055,000	3,555,000	–	44,200,000	2,514,000	8.64	4.485	51.9
Total								52.86	26.080	
Average for year	–	965,000	20,225,000	580,000	–	21,770,000	1,238,000			49.3

TABLE No. 6. — *Sources from which and Periods during which Water has been drawn for the Supply of the Metropolitan Water District in 1936*

From Wachusett Reservoir into the Wachusett Aqueduct

MONTH	Number of Days during which Water was Flowing	ACTUAL TIME		* Million Gallons Drawn
		Hours	Minutes	
January	23	218	52	3,199.1
February	23	205	38	3,002.7
March	18	170	02	2,503.0
April	25	253	05	3,748.2
May	25	290	30	4,344.3
June	26	291	40	4,339.1
July	26	326	32	4,780.3
August	26	308	15	4,502.7
September	25	255	10	3,730.7
October	26	270	20	3,937.7
November	24	220	25	3,194.9
December	13	135	07	1,972.1
Totals	280	122.73 days		43,254.8

*Including quantity supplied Westborough State Hospital.

From Sudbury Reservoir through the Weston Aqueduct to Weston Reservoir

MONTH	Number of Days during which Water was Flowing	ACTUAL TIME		Million Gallons Drawn
		Hours	Minutes	
January	31	744	00	3,331.5
February	29	696	00	3,252.2
March	31	744	00	3,239.2
April	30	715	00	3,153.7
May	31	740	30	3,351.8
June	30	718	46	3,459.2
July	31	734	29	3,538.1
August	31	740	38	3,515.9
September	30	703	34	3,197.7
October	31	740	00	3,290.1
November	30	699	15	3,215.2
December	31	743	00	3,398.7
Totals	366	363.30 days		39,943.3

From Framingham Reservoir No. 3 through Sudbury Aqueduct to Chestnut Hill Reservoir

MONTH	Number of Days during which Water was Flowing	ACTUAL TIME		Million Gallons Drawn
		Hours	Minutes	
January	31	744	00	715.0
February	29	696	00	697.7
March	31	744	00	542.0
April	30	719†	00	453.1
May	31	744	00	623.8
June	30	720	00	746.1
July	31	744	00	873.5
August	31	744	00	803.3
September	30	721†	00	678.8
October	31	744	00	668.4
November	30	720	00	592.6
December	31	744	00	669.5
Totals	366	366.0 days		8,063.8

†Daylight Saving change.

TABLE No. 7. — *Average Daily Quantity of Water flowing through Aqueducts in 1936 by Months*

MONTH	Wachusett Aqueduct into Sudbury Reservoir (Gallons)	Weston Aqueduct into Metropolitan District (Gallons)	Sudbury Aqueduct into Chestnut Hill Reservoir (Gallons)	Cochituate Aqueduct into Chestnut Hill Reservoir (Gallons)
January	102,977,000	107,468,000	23,065,000	–
February	103,328,000	112,144,000	24,059,000	–
March	80,516,000	104,490,000	17,484,000	–
April	124,887,000	105,270,000	15,124,000	–
May	139,890,000	108,123,000	20,123,000	–
June	144,380,000	115,307,000	24,870,000	–
July	153,932,000	114,132,000	28,177,000	–
August	144,977,000	113,416,000	25,913,000	–
September	123,928,000	106,442,000	22,595,000	–
October	126,771,000	106,132,000	21,561,000	–
November	106,247,000	107,174,000	19,753,000	–
December	63,374,000	109,635,000	21,596,000	–
Average	117,938,000	109,135,000	22,033,000	–

TABLE No. 8. — (*Meter Basis*). *Average Daily Consumption of Water by Districts in the Cities and Towns supplied by the Metropolitan Water Works in 1936*

MONTH	LOW SERVICE	SOUTHERN HIGH SERVICE	INTERMEDIATE HIGH SERVICE	NORTHERN HIGH SERVICE	SOUTHERN EXTRA HIGH SERVICE	NORTHERN EXTRA HIGH SERVICE	Total District Supplied (Gallons)	Estimated Population	Consumption per Inhabitant (Gallons)
	Portions of Arlington, Belmont, Boston, Chelsea, Everett, Malden, Medford, Somerville and Watertown (Gallons)	Quincy and Portions of Boston, Milton and Watertown (Gallons)	Portions of Belmont and Watertown (Gallons)	Melrose, Nahant, Revere, Stoneham, Swampscott and Winthrop and Portions of Boston, Chelsea, Everett, Malden, Medford and Somerville (Gallons)	Portions of Boston and Milton (Gallons)	Lexington and Portions of Arlington and Belmont (Gallons)			
January	70,890,100	47,044,400	1,415,100	11,886,200	1,596,800	1,695,000	134,527,600	1,441,580	93
February	73,524,200	47,457,600	1,412,600	12,307,000	1,685,500	1,948,000	138,334,900	1,442,390	96
March	68,494,100	45,720,000	1,421,500	12,352,300	1,815,300	1,882,000	131,685,200	1,443,200	91
April	64,188,000	43,897,800	1,367,700	11,832,200	1,741,400	1,749,800	124,776,900	1,444,020	86
May	65,148,100	45,630,200	1,535,300	13,164,600	1,946,400	2,113,600	129,538,200	1,444,830	90
June	69,135,700	48,772,700	1,824,900	14,578,700	2,118,600	2,545,000	138,975,600	1,445,640	96
July	70,019,800	49,303,800	1,679,500	14,954,600	1,998,800	2,627,200	140,583,700	1,446,450	97
August	70,398,500	49,294,100	1,598,700	13,803,300	1,877,200	2,364,800	139,336,600	1,447,270	96
September	68,050,900	47,743,400	1,446,600	12,450,200	1,768,700	1,937,900	133,397,700	1,448,080	92
October	67,170,400	46,051,900	1,422,500	12,021,900	1,817,500	1,867,900	130,352,100	1,448,900	90
November	67,069,400	44,537,900	1,424,600	11,722,200	1,730,700	1,853,700	128,338,500	1,449,710	89
December	70,358,100	46,608,400	1,427,400	11,975,900	1,695,100	1,877,700	133,942,600	1,450,530	92
For the year	68,695,000	46,841,700	1,498,300	12,757,700	1,816,400	2,039,300	133,648,400	1,446,450	92

TABLE NO. 9. — (*Meter Basis*). *Average Daily Consumption of Water in Cities and Towns supplied by the Metropolitan Water Works in 1936*

City or town	ARLINGTON		BELMONT		BOSTON		CHELSEA		EVERETT		LEXINGTON		MALDEN	
Population	39,320		25,800		829,250		41,680		46,860		11,230		57,040	
MONTH	Gallons		Gallons		Gallons		Gallons		Gallons		Gallons		Gallons	
	Per Day	Per Capita	Per Day	Per Capita	Per Day	Per Capita	Per Day	Per Capita	Per Day	Per Capita	Per Day	Per Capita	Per Day	Per Capita
January	1,961,200	50	1,220,000	48	92,864,000	113	3,348,500	80	4,519,500	96	540,500	49	3,801,100	67
February	2,081,900	53	1,254,800	49	95,025,000	115	3,470,300	83	4,864,200	104	715,200	64	3,943,100	69
March	2,090,400	53	1,267,100	50	89,339,400	108	3,244,100	77	4,641,200	99	633,400	57	3,853,700	68
April	2,001,700	51	1,276,700	50	84,041,700	102	3,100,000	74	4,411,900	94	544,900	49	3,749,200	66
May	2,267,500	58	1,416,400	55	85,997,500	104	3,191,700	76	4,458,000	95	718,300	64	3,776,600	66
June	2,589,300	66	1,754,700	68	91,089,100	110	3,404,500	82	4,618,600	99	846,700	76	4,072,500	71
July	2,689,300	68	1,711,100	66	92,449,400	111	3,430,100	82	4,517,500	96	891,100	79	4,153,300	73
August	2,395,900	61	1,604,400	62	92,931,700	112	3,396,600	82	4,434,100	95	786,000	70	4,028,500	71
September	2,091,400	53	1,286,800	50	90,387,600	109	3,314,400	80	4,534,200	97	611,000	54	4,066,700	71
October	2,033,900	52	1,260,800	49	88,351,900	106	3,159,200	76	4,529,300	97	590,000	52	3,925,300	69
November	2,044,500	52	1,274,400	49	86,843,300	104	2,943,700	71	4,553,100	97	561,100	50	3,834,700	67
December	2,106,400	53	1,273,600	49	92,080,600	111	2,886,500	70	4,579,100	98	571,400	50	3,753,100	66
For the year	2,196,900	56	1,383,900	54	90,112,100	109	3,240,100	78	4,553,600	97	667,500	59	3,912,800	69

TABLE No. 9. — Continued — (*Meter Basis*). *Average Daily Consumption of Water in Cities and Towns, etc.*

City or town	MEDFORD		MELROSE		MILTON		NAHANT		QUINCY		REVERE	
Population	61,980		24,610		18,690		1,780		78,470		35,200	
MONTH	Gallons		Gallons		Gallons		Gallons		Gallons		Gallons	
	Per Day	Per Capita	Per Day	Per Capita	Per Day	Per Capita	Per Day	Per Capita	Per Day	Per Capita	Per Day	Per Capita
January	3,228,400	52	1,366,100	56	876,000	47	142,500	81	5,203,900	67	1,933,600	55
February	3,150,300	51	1,481,900	60	898,200	48	159,100	90	5,371,900	69	1,954,200	55
March	3,140,500	51	1,515,200	62	943,300	51	200,200	113	5,282,300	68	1,945,700	55
April	3,041,400	49	1,344,200	55	868,700	47	154,700	87	5,054,700	65	1,878,800	53
May	3,357,200	54	1,531,000	62	1,076,200	58	233,400	131	5,342,900	68	2,167,800	62
June	3,643,600	59	1,796,400	73	1,212,600	65	326,800	184	5,568,000	71	2,625,200	75
July	3,460,100	56	1,708,800	69	1,090,200	58	368,700	207	5,627,800	72	2,825,900	80
August	3,343,100	54	1,516,300	62	1,069,600	57	321,700	181	5,568,900	71	2,631,200	75
September	3,249,500	52	1,448,300	59	990,900	53	235,500	132	5,335,200	68	2,057,500	58
October	3,310,300	53	1,422,000	58	1,044,600	56	155,900	88	5,099,300	65	1,924,600	55
November	3,348,900	54	1,451,400	59	1,007,000	54	145,200	81	5,117,200	65	1,823,800	52
December	3,202,500	52	1,622,100	6	981,200	52	162,300	91	5,102,000	65	1,840,400	52
For the year	3,290,100	53	1,517,300	62	1,005,300	54	217,500	122	5,306,200	68	2,135,500	61

TABLE No. 9. — Concluded — (*Meter Basis*). *Average Daily Consumption of Water in Cities and Towns, etc.*

City or town	SOMERVILLE		STONEHAM		SWAMPSCOTT		WATERTOWN		WINTHROP		METROPOLITAN DISTRICT	
Population	99,780		11,080		10,520		36,120		17,040		1,446,450	
MONTH	Gallons		Gallons		Gallons		Gallons		Gallons		Gallons	
	Per Day	Per Capita	Per Day	Per Capita	Per Day	Per Capita	Per Day	Per Capita	Per Day	Per Capita	Per Day	Per Capita
January	9,195,100	92	623,000	57	691,100	66	1,946,800	54	1,066,300	63	134,527,600	93
February	9 505,100	95	681,800	62	716,300	68	1,926,600	53	1,135,000	67	138,334,900	96
March	9,107,000	91	642,900	58	717,900	68	1,994,400	55	1,126,500	66	131,685,200	91
April	8,953,000	90	628,800	57	683,000	65	1,960,900	54	1,082,600	64	124,776,900	86
May	9,033,500	90	756,300	68	975,300	93	2,043,200	57	1,195,400	70	129,538,200	90
June	9,740,100	98	797,800	72	1,136,100	108	2,489,100	69	1,264,500	74	138,975,600	96
July	9,944,000	100	817,600	74	1,286,600	122	2,246,100	62	1,366,100	80	140,583,700	97
August	9,855,400	99	758,400	68	1,142,100	109	2,163,800	60	1,388,900	82	139,336,600	96
September	9,125,800	92	640,900	58	871,100	83	2,014,500	56	1,136,400	67	133,397,700	92
October	9,110,800	91	652,400	59	740,400	70	2,018,300	56	1,023,100	60	130,352,100	90
November	9,165,000	92	663,300	60	624,600	59	1,947,200	54	990,100	58	128,338,500	89
December	9,480,600	95	645,300	58	627,500	60	1,942,800	54	1,085,200	64	133,942,600	92
For the year	9,351,600	94	692,500	63	852,000	81	2,058,000	57	1,155,500	68	133,648,400	92

TABLE No. 10. — *Chemical Examinations of Water from the Wachusett Reservoir, Clinton in 1936*

(Parts per 1,000,000)

Date of Collection	Appearance		Odor		Residue on Evaporation		Ammonia		Hydrogen-ion Concentration	Manganese	Chlorides	Hardness
	Turbidity	Sediment	Cold	Hot	Total	Loss on Ignition	Free	Albuminoid				
Jan. 7	V. slight	V. slight	V. faintly vegetable	V. faintly vegetable	44	12	.002	.066	–	–	2.6	14
Jan. 21	V. slight	V. slight	V. faintly vegetable	Faintly vegetable	–	–	.008	.090	–	–	2.5	–
Feb. 4	V. slight	V. slight	V. faintly vegetable	V. faintly vegetable	31	11	.012	.068	–	.00	2.5	13
Feb. 18	V. slight	V. slight	Faintly vegetable	Distinctly unpleasant	–	–	.012	.116	–	.02	2.8	–
Mar. 17	V. slight	V. slight	V. faintly vegetable	V. faintly vegetable	33	14	.006	.076	–	–	2.8	13
Mar. 31	V. slight	V. slight	V. faintly vegetable	Faintly vegetable	–	–	.006	.086	–	–	2.4	–
Apr. 7	V. slight	V. slight	V. faintly vegetable	Faintly vegetable	30	10	.012	.116	–	–	2.5	14
Apr. 28	V. slight	V. slight	V. faintly vegetable	V. faintly vegetable	–	–	.000	.078	–	–	2.5	–
May 5	V. slight	V. slight	V. faintly vegetable	V. faintly vegetable	32	12	.008	.088	–	.00	2.4	11
May 19	V. slight	Slight	V. faintly vegetable	V. faintly vegetable	–	–	.008	.100	–	.00	2.0	–
June 2	V. slight	V. slight	V. faintly vegetable	V. faintly vegetable	35	13	.028	.102	–	–	1.6	13
June 23	V. slight	V. slight	V. faintly vegetable	V. faintly vegetable	–	–	.006	.116	–	–	2.5	–
July 7	V. slight	V. slight	V. faintly vegetable	V. faintly vegetable	36	14	.004	.066	–	–	2.5	14
July 21	V. slight	V. slight	V. faintly vegetable	V. faintly vegetable	–	–	.102	.096	6.5[1]	–	2.5	–
Aug. 4	V. slight	V. slight	V. faintly vegetable	V. faintly vegetable	33	11	.012	.134	–	.02	2.4	13
Aug. 18	V. slight	V. slight	V. faintly vegetable	Faintly vegetable	–	–	.004	.100	–	.01	2.5	–
Sept. 8	V. slight	V. slight	V. faintly vegetable	V. faintly vegetable	37	12	.004	.108	–	–	2.5	14
Sept. 22	V. slight	V. slight	V. faintly vegetable	V. faintly vegetable	–	–	.002	.106	–	–	2.9	–
Oct. 6	V. slight	V. slight	V. faintly vegetable	Faintly vegetable	35	14	.012	.092	–	–	2.6	17
Oct. 20	V. slight	V. slight	V. faintly vegetable	Faintly vegetable	–	–	.008	.088	–	–	2.5	–
Nov. 3	V. slight	V. slight	V. faintly vegetable	V. faintly vegetable	36	13	.006	.068	–	.07	2.5	14
Dec. 8	V. slight	V. slight	V. faintly vegetable	V. faintly vegetable	–	–	.004	.060	–	–	2.5	–
Dec. 21	V. slight	V. slight	V. faintly vegetable	V. faintly vegetable	33	14	.004	.090	–	–	2.8	13
Average	.....	.....	.....	.....	35	13	.012	.092	6.5	.02	2.5	14

Wachusett Aqueduct Terminal Chamber.

Table No. 11. — *Chemical Examinations of Water from the Sudbury Reservoir in 1936*

(Parts per 1,000,000)

Date of Collection	Appearance		Odor		Residue on Evaporation		Ammonia		Hydrogen-ion Concentration	Manganese	Chlorides	Hardness
	Turbidity	Sediment	Cold	Hot	Total	Loss on Ignition	Free	Albuminoid				
Jan. 6	V. slight	V. slight	V. faintly vegetable	V. faintly vegetable	–	–	.006	.134	–	–	3.4	–
Feb. 11	V. slight	V. slight	V. faintly vegetable	V. faintly vegetable	40	14	.018	.142	–	.02	3.2	18
Mar. 17	V. slight	V. slight	V. faintly vegetable	V. faintly vegetable	–	–	.016	.166	–	–	3.2	–
Apr. 7	Slight	V. slight	V. faintly vegetable	V. faintly vegetable	41	16	.012	.146	–	–	3.2	17
May 12	V. slight	V. slight	Faintly vegetable	Distinctly fishy	–	–	.014	.144	–	.00	3.0	–
June 2	V. slight	V. slight	V. faintly vegetable	V. faintly vegetable	47	16	.006	.124	–	–	3.6	14
July 7	V. slight	Slight	V. faintly vegetable	V. faintly vegetable	–	–	.008	.172	6.9	–	2.8	–
Aug. 11	V. slight	V. slight	V. faintly vegetable	V. faintly vegetable	36	12	.012	.156	–	.00	2.6	16
Sept. 8	V. slight	V. slight	V. faintly vegetable	V. faintly vegetable	–	–	.008	.122	–	–	2.8	–
Oct. 6	V. slight	V. slight	V. faintly vegetable	Faintly vegetable	42	14	.008	.104	–	–	2.5	16
Nov. 3	V. slight	V. slight	V. faintly vegetable	Faintly vegetable	–	–	.012	.104	–	.01	2.5	–
Dec. 8	V. slight	V. slight	V. faintly vegetable	V. faintly vegetable	36	14	.004	.088	6.9	–	2.8	20
Average	.....	.....	.....	.....	40	14	.010	.134	6.9	.01	3.0	17

Table No. 12. — *Chemical Examinations of Water from Spot Pond, Stoneham in 1936*

(Parts per 1,000,000)

Jan. 27	V. slight	V. slight	V. faintly vegetable	Faintly vegetable	–	–	.006	.114	–	–	3.8	–
Feb. 3	V. slight	V. slight	V. faintly vegetable	V. faintly vegetable	39	15	.004	.110	–	.02	3.8	17
Mar. 16	V. slight	V. slight	V. faintly vegetable	Faintly vegetable	–	–	.016	.098	–	–	4.0	–
Apr. 6	V. slight	V. slight	V. faintly vegetable	Faintly vegetable	36	15	.002	.112	–	–	3.8	18
May 11	V. slight	V. slight	V. faintly vegetable	Faintly vegetable	–	–	.004	.110	–	.02	3.8	–
June 8	V. slight	V. slight	V. faintly vegetable	V. faintly vegetable	37	14	.008	.154	–	–	3.1	17
July 13	V. slight	V. slight	V. faintly vegetable	V. faintly vegetable	–	–	.000	.130	–	–	3.8	–
Aug. 10	V. slight	V. slight	V. faintly vegetable	V. faintly vegetable	40	11	.000	.148	–	.05	3.5	14
Sept. 14	V. slight	V. slight	V. faintly vegetable	Faintly vegetable	–	–	.034	.102	–	–	3.6	–
Oct. 13	V. slight	V. slight	V. faintly vegetable	V. faintly vegetable	39	15	.006	.110	–	–	3.8	18
Nov. 9	V. slight	V. slight	V. faintly vegetable	Faintly vegetable	–	–	.000	.110	–	.00	3.4	–
Dec. 14	V. slight	V. slight	V. faintly vegetable	V. faintly vegetable	40	16	.022	.118	6.9	–	3.5	16
Average	.....	.....	.....	.....	39	14	.009	.118	6.9	.02	3.7	17

TABLE No. 13. — *Chemical Examinations of Water from Lake Cochituate in 1936*

(Parts per 1,000,000)

Date of Collection	Appearance		Odor		Residue on Evaporation		Ammonia		Hydrogen-ion Concentration	Manganese	Chlorides	Hardness
	Turbidity	Sediment	Cold	Hot	Total	Loss on Ignition	Free	Albuminoid				
Jan. 8	V. slight	V. slight	None	V. faintly vegetable	–	–	.024	.106	–	–	7.2	–
Feb. 5	V. slight	V. slight	V. faintly vegetable	Faintly vegetable	78	22	.058	.174	–	.12	8.8	33
Mar. 18	V. slight	V. slight	V. faintly vegetable	Faintly vegetable	–	–	.416	.164	–	–	8.4	–
Apr. 8	V. slight	V. slight	V. faintly vegetable	Faintly vegetable	76	24	.280	.060	–	–	7.4	29
June 3	V. slight	V. slight	V. faintly vegetable	Faintly unpleasant	–	–	.254	.160	–	–	7.6	–
Aug. 5	V. slight	V. slight	V. faintly vegetable	V. faintly vegetable	72	20	.034	.198	–	.01	7.6	31
Oct. 7	V. slight	V. slight	V. faintly vegetable	Faintly vegetable	–	–	.018	.170	–	–	7.6	–
Nov. 4	V. slight	V. slight	V. faintly vegetable	Faintly vegetable	70	20	.016	.146	–	.13	7.8	29
Dec. 9	Slight	V. slight	Faintly vegetable	Faintly vegetable	–	–	.036	.126	–	–	7.6	–
Average	.....	.....	.....	.....	74	22	.126	.145	–	.09	7.8	31

TABLE No. 14. — *Chemical Examinations of Water from a Tap at the State House, Boston in 1936*

(Parts per 1,000,000)

Jan. 7	V. slight	V. slight	V. faintly vegetable	V. faintly vegetable	–	–	.004	.068	–	–	3.8	–
Feb. 10	V. slight	V. slight	V. faintly vegetable	V. faintly vegetable	40	12	.014	.082	–	.00	4.0	18
Mar. 19	V. slight	V. slight	V. faintly vegetable	V. faintly vegetable	–	–	.030	.092	–	–	4.0	–
Apr. 6	V. slight	V. slight	Faintly vegetable	Faintly sweetish	39	17	.010	.124	–	–	4.0	16
May 7	Slight	V. slight	V. faintly vegetable	Faintly vegetable	–	–	.006	.118	–	.03	4.0	–
June 4	V. slight	V. slight	V. faintly vegetable	V. faintly vegetable	37	12	.008	.114	–	–	4.0	20
July 7	V. slight	None	V. faintly vegetable	V. faintly vegetable	–	–	.002	.124	6.8[1]	–	3.8	–
Aug. 5	None	None	V. faintly vegetable	V. faintly vegetable	38	12	.012	.100	–	.03	4.0	16
Sept. 8	V. slight	V. slight	V. faintly vegetable	Faintly vegetable	–	–	.002	.074	–	–	3.8	–
Oct. 16	None	None	V. faintly vegetable	Faintly vegetable	40	14	.008	.110	–	–	3.8	17
Nov. 4	V. slight	V. slight	V. faintly vegetable	V. faintly vegetable	–	–	.000	.110	–	.02	3.9	–
Dec. 10	V. slight	V. slight	V. faintly vegetable	V. faintly vegetable	33	10	.006	.068	–	–	3.8	20
Average	.....	.....	.....	.....	38	13	.009	.099	6.8	.02	3.9	18

[1] Tap at Fisher Hill Reservoir after chlorination.

TABLE NO. 15. — *Chemical Examinations of Water from a Faucet in Boston, 1898–1936*

(Parts per 1,000.000)

YEAR	COLOR	RESIDUE ON EVAPORATION		AMMONIA				CHLORINE	OXYGEN CONSUMED	HARDNESS
					ALBUMINOID					
	Platinum Standard	Total	Loss on Ignition	Free	Total	Dissolved	Suspended			
1898	40	41.9	16.0	.008	.152	.136	.016	2.9	4.4	14
1899	28	37.0	13.0	.006	.136	.122	.014	2.4	3.5	11
1900	29	38.0	12.0	.012	.157	.139	.018	2.5	3.8	13
1901	29	44.3	16.4	.013	.158	.142	.016	3.0	4.2	17
1902	30	39.3	15.6	.016	.139	.119	.020	2.9	4.0	17
1903	29	39.8	15.0	.013	.125	.110	.015	3.0	3.9	15
1904	23	39.3	15.9	.023	.139	.121	.018	3.4	3.7	15
1905	24	38.6	15.9	.020	.145	.124	.021	3.5	3.5	14
1906	24	38.6	13.9	.018	.159	.134	.025	3.4	3.6	13
1907	22	38.3	14.0	.013	.129	.109	.020	3.3	3.2	13
1908	19	35.0	13.5	.011	.115	.092	.024	3.3	2.6	12
1909	18	34.6	14.3	.011	.128	.103	.025	2.8	2.5	13
1910	14	30.5	12.4	.013	.118	.102	.016	2.8	2.2	11
1911	25	41.8	16.6	.015	.156	.128	.029	3.8	3.3	14
1912	17	38.6	12.3	.018	.154	.119	.034	3.6	2.9	17
1913	13	39.6	11.5	.014	.150	.120	.026	3.5	2.6	15
1914	14	41.2	11.9	.014	.138	.116	.022	3.9	2.5	14
1915	16	37.3	10.4	.015	.157	.134	.023	3.8	2.5	14
1916	18	45.3	18.5	.013	.133	.107	.026	3.6	–	14
1917	15	44.5	16.8	.015	.142	.124	.018	3.3	–	13
1918	18	38.9	14.5	.019	.154	.128	.026	2.9	–	14
1919	20	42.8	14.1	.010	.130	.108	.022	3.6	–	15
1920	17	42.3	13.5	.012	.112	.097	.014	3.3	–	15
1921	13	38.0	13.9	.006	.104	.089	.015	2.5	–	14
1922	16	39.8	15.5	.011	.097	.080	.017	3.0	–	18
1923	15	39.0	14.5	.011	.100	.090	.010	2.6	–	15
1924	12	41.0	16.0	.011	.109	.084	.025	2.8	–	15
1925	9	39.8	16.2	.013	.109	.093	.016	2.9	–	15
1926	10	41.8	16.8	.015	.115	.092	.023	3.2	–	15
1927	22	44.7	16.2	.013	.111	.101	.018	3.4	–	19
1928	27	44.3	17.2	.011	.124	.106	.018	3.7	–	15
1929	21	42.6	17.1	.007	.106	.074	.032	3.0	–	13
1930	16	40.7	13.4	.012	.071	.055	.016	3.4	–	13
1931	24	48.8	16.4	.013	.097	.072	.025	4.5	–	20
1932	19	43.5	16.0	.007	.102	.075	.027	3.9	–	16
1933	19	41.5	14.1	.010	.095	.069	.026	4.0	–	19
1934	19	40.3	13.8	.013	.083	.062	.021	3.8	–	19
1935	17	42.9	15.6	.027	.095	6.7[1]	.025[2]	4.0	–	17
1936	15	37.8	12.8	.009	.099	6.8[1]	.020[2]	3.9	–	18

[1] Hydrogen-ion Concentration. [2] Manganese.

TABLE No. 16. — *Number of Bacteria per Cubic Centimeter in Water from Various Parts of the Metropolitan Water Works, 1898–1936.*
(Averages of Weekly Determinations.)

Year	Chestnut Hill Reservoir			Southern Service Taps	
	Sudbury Aqueduct Terminal Chamber	Cochituate Aqueduct	Effluent Gate House No. 2	Low Service 182 Boylston Street, Boston	High Service 20 Somerset Street, Boston
1898	207	145	111	96	–
1899	224	104	217	117	123
1900	248	113	256	188	181
1901	225	149	169	162	168
1902	203	168	121	164	246
1903	76	120	96	126	243
1904	347	172	220	176	355
1905	495	396	489	231	442
1906	231	145	246	154	261
1907	147	246	118	130	176
1908	162	138	137	136	148
1909	198	229	119	150	195
1910	216	–	180	178	213
1911	205	204	151	175	197
1912	429	450	227	249	259
1913	123	243	157	119	140
1914	288	–	252	174	220
1915	163	–	128	117	134
1916	128	–	85	102	105
1917	178	112	119	119	141
1918	1,163	168	705	317	544
1919	92	85	100	70	84
1920	148	86	108	113	112
1921	103	–	83	92	92
1922	163	–	153	160	172
1923	229	–	178	217	230
1924	137	–	96	150	160
1925	144	251	120	155	174
1926	167	–	118	130	137
1927	119	185	70	81	101
1928	144	32	86	106	106
1929	128	–	84	130	144
1930	107	–	66	105	123
1931	82*	4*	43	80	101
1932	121*	–	63	123	147
1933	20*	–	15	40	45
1934	10*	–	26	42	31
1935	4*	–	32	35	18
1936	21*	–	56	51	59

* After the water was sterilized with chlorine.

TABLE No. 17. — *Colors of Water at Various Places on the Metropolitan Water Works in 1936*

(Platinum Standard)

MONTH	WACHUSETT [1] RESERVOIR						WACHUSETT AQUEDUCT INFLUENT	SUDBURY [1] RESERVOIR			FRAMINGHAM RESERVOIR No. 3	LAKE [1] COCHITUATE			CHESTNUT HILL RESERVOIR			SPOT [1] POND	FELLS RESERVOIR	SOUTHERN SERVICE		NORTHERN SERVICE	
	Quinapoxet River Influent	Stillwater River Influent	Worcester St. Bridge	Surface near Dam	Mid-depth near Dam	Bottom near Dam	Lower End of Open Channel	Surface near Dam	Mid-depth near Dam	Bottom near Dam	Mid-depth near Dam	Surface near Gate House	Mid-depth near Gate House	Bottom near Gate House	Sudbury Aqueduct Influent	Cochituate Aqueduct Influent	Effluent Gate House No. 2	Mid-depth near East Gate House	Effluent Gate House	Tap at 182 Boylston St., Boston, Low Service	Tap at 20 Somerset St., Boston, High Service	Tap at Glenwood Yard, Medford, Low Service	Tap at Glenwood Yard, Medford, High Service
January	44	36	46	14	14	14	16	18	16	18	17	24	23	24	15	–	13	13	12	14	14	14	13
February	43	27	33	12	12	12	14	18	–	16	17	25	22	23	15	–	12	11	11	14	14	14	13
March	37	30	31	13	13	13	33	18	21	17	17	26	27	27	16	–	13	11	11	15	16	15	13
April	37	32	32	19	20	19	29	29	28	30	29	29	29	29	23	–	15	13	13	25	24	25	13
May	51	46	36	21	21	20	24	25	26	27	27	27	27	31	23	–	18	13	12	22	22	22	15
June	46	40	26	20	21	19	22	24	24	25	26	22	26	52	22	–	18	13	14	20	20	20	14
July	33	25	20	18	18	17	18	17	18	18	22	18	24	107	17	–	15	12	12	16	16	16	13
August	31	21	14	12	–	13	14	15	–	15	–	14	23	98	15	–	12	12	12	13	13	12	13
September	33	25	13	15	12	14	13	13	14	14	15	14	25	158	13	–	12	12	12	13	13	12	13
October	64	52	14	10	12	11	13	12	12	13	13	15	21	142	11	–	11	12	12	11	11	10	12
November	50	32	13	11	11	12	12	12	12	12	12	19	20	71	11	–	11	11	11	12	11	11	11
December	50	44	47	10	10	11	96	12	12	12	–	20	–	–	11	–	10	10	10	12	11	11	10
Mean	43	34	27	15	15	15	25	18	18	18	20	21	24	69	16	–	13	12	12	16	15	15	13

[1] Mid-depth and bottom colors are averages of bi-weekly determinations, all others are averages of weekly determinations.

TABLE No. 18. — *Temperatures of Water at Various Places on the Metropolitan Water Works in 1936*

(The temperatures are taken at the same places and times as the samples for microscopical examination, the depth at place of observation from high-water mark.)
[Degrees Fahrenheit]

MONTH	WACHUSETT [1] RESERVOIR DEPTH AT PLACE OF OBSERVATION NEAR DAM 107 FEET			WACHUSETT AQUEDUCT INFLUENT	SUDBURY [1] RESERVOIR DEPTH AT PLACE OF OBSERVATION NEAR DAM 54.5 FEET			FRAMINGHAM [1] RESERVOIR NO. 3 DEPTH AT PLACE OF OBSERVATION NEAR DAM 20.5 FEET			LAKE [1] COCHITUATE DEPTH AT PLACE OF OBSERVATION NEAR GATE HOUSE 62.0 FEET			CHESTNUT HILL RESERVOIR	SPOT POND [1] DEPTH AT PLACE OF OBSERVATION NEAR EAST GATE HOUSE 28.0 FEET			SOUTHERN SERVICE		NORTHERN SERVICE	
	Surface	Mid-depth	Bottom	Lower End of Open Channel	Surface	Mid-depth	Bottom	Surface	Mid-depth	Bottom	Surface	Mid-depth	Bottom	Effluent Gate House No. 2	Surface	Mid-depth	Bottom	Tap at 182 Boylston St., Boston, Low Service	Tap at 20 Somerset St., Boston, High Service	Tap at Glenwood Yard, Medford, Low Service	Tap at Glenwood Yard, Medford, High Service
January	33.7	–	34.6	34.1	35.0	36.5	–	37.6	38.5	37.0	36.4	37.3	38.3	36.8	35.2	35.5	35.4	39.2	39.6	40.6	41.4
February	34.1	–	34.1	35.0	34.3	–	37.6	35.7	36.3	37.5	33.8	38.0	38.9	37.6	34.7	34.0	35.5	38.6	38.9	38.5	39.2
March	35.4	35.1	35.0	39.1	36.9	39.9	38.0	38.9	36.0	38.0	39.4	39.8	40.9	40.7	36.9	37.6	36.8	41.4	42.6	39.2	39.5
April	41.3	40.6	43.7	43.6	48.4	46.8	45.3	45.5	45.5	44.5	46.2	45.9	45.3	46.5	44.5	44.8	45.3	47.5	48.1	45.9	44.3
May	56.8	52.8	52.7	52.4	62.4	60.5	52.3	61.8	58.8	62.0	60.1	50.5	48.7	61.3	59.0	56.8	58.5	60.2	59.9	57.0	53.5
June	65.4	62.2	58.0	57.5	68.8	64.5	57.5	69.2	68.0	67.0	70.7	52.0	49.4	68.6	67.7	65.5	67.7	68.1	68.8	64.6	60.7
July	72.8	61.8	62.3	60.4	74.0	69.5	64.3	74.4	71.8	72.3	74.7	53.6	50.3	73.1	72.6	72.3	70.5	72.7	73.3	69.8	65.9
August	74.7	71.1	61.6	63.4	75.1	–	69.9	74.9	74.3	73.5	75.2	54.6	50.7	74.8	74.1	75.3	72.3	74.9	74.4	71.8	70.0
September	67.0	66.8	59.9	62.9	68.1	66.9	66.8	67.9	67.1	68.5	69.7	53.1	50.0	67.6	67.0	68.2	67.0	69.3	69.9	68.5	65.9
October	58.0	56.9	57.5	55.8	58.1	58.0	60.5	56.8	54.5	58.3	58.7	55.5	50.0	58.5	58.1	57.5	59.0	61.1	61.9	61.8	60.1
November	48.8	52.0	50.2	66.9	47.9	46.5	49.3	44.3	37.0	46.5	50.0	49.8	47.6	47.4	47.8	45.8	49.8	51.0	51.0	52.8	52.6
December	37.7	37.6	37.9	38.5	39.1	41.0	36.0	37.2	–	–	37.9	–	–	36.9	34.6	35.0	34.9	39.6	39.3	43.0	42.4
Mean	52.1	53.7	49.0	50.8	54.0	53.0	52.5	53.7	53.4	55.0	54.4	48.2	46.4	54.2	52.7	52.4	52.7	55.3	55.6	54.5	53.0

[1] Mid-depth and bottom temperatures are averages of bi-weekly determinations, all others are averages of weekly determinations.

TABLE NO. 19. — *Length of Metropolitan Water Works Main Lines and Connections and Number of Valves set in Same, December 31, 1936*

(Pipes are of cast-iron unless otherwise noted)

	Diameter of pipes in inches																		
	60	56	54	48	42	40	38	36	30	24	20	16	14	12	10	8	6	4	Total
Total length owned and operated Dec. 31, 1935 (feet)	130,179	17,634	13,486	227,978	11,733	6,887	7,274	64,091	78,375	101,572	144,500	79,690	26	29,926	724	1,964	1,199	58	917,296
Gate Valves in same	22	2	5	62	3	3	–	80	49	71	103	146	1	158	22	30	26	2	785
Air Valves in same	190	9	12	149	10	5	6	49	46	60	96	42	–	10	1	–	–	–	685
Length laid or relaid during 1936 (feet)	–	–	–	711	–	–	–	–	103	–	6,769	86	–	73	–	43	11	8	7,804
Gate Valves in same	–	–	–	–	–	–	–	–	–	–	4	4	–	2	–	4	2	–	16
Air Valves in same	–	–	–	–	–	–	–	–	–	–	3	1	–	–	–	–	–	–	4
Length abandoned during 1936 (feet)	–	–	–	7	–	–	–	–	103	–	8	12	–	24	–	43	–	8	205
Gate Valves in same	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	1	–	–	1
Air Valves in same	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
Length owned and operated Dec. 31, 1936 (feet)	130,179 [1]	17,634	13,486 [2]	228,682 [3]	11,733 [4]	6,887	7,274 [2]	64,091 [5]	78,375 [6]	101 572 [7]	151,261 [8]	79,764 [9]	26	29,975 [10]	724	1,964	1,210	58	924,895 [11]
Gate Valves in same	22	2	5	62	3	3	–	80	49	71	107	150	1	160	22	33	28	2	800
Air Valves in same	190	9	12	149	10	5	6	49	46	60	99	43	–	10	1	–	–	–	689

[1] Includes 2,035 feet of 76-inch concrete-lined pressure tunnel; 363 feet of 76 inch mortar-lined and concrete-covered steel pipe; 21 feet of 76-inch cast-iron pipe; 85 fee of 60-inch concrete-covered steel pipe, and 82,624 feet of 60-inch steel pipe.
[2] Steel pipe.
[3] Includes 13,040 feet of steel pipe.
[4] Includes 1,853 feet of steel pipe.
[5] Includes 286 feet of steel pipe.
[6] Includes 15,512 feet of mortar-lined and covered wrought-iron pipe; 7,213 feet of cement-lined cast-iron pipe and 19,437 feet of steel pipe.
[7] Includes 55 feet of steel pipe.
[8] Includes 33,317 feet of cement-lined cast-iron pipe and 1,121 feet of steel pipe.
[9] Includes 1,856 feet of cement-lined cast-iron pipe.
[10] Includes 627 feet of cement-lined cast-iron pipe.
[11] 175.17 miles.

TABLE No. 20. — *Length of Metropolitan Water Works Hydrant, Blow-off and Drain Pipes, December 31, 1936*

(All pipes are of cast-iron)

	Diameter of Pipes in Inches								
	24	20	16	12	10	8	6	4	Total
Total length in use Dec. 31, 1935 (feet)	352	292	4,270	7,706	220	1,315	4,748	1,928	20,831
Valves in same	–	–	60	135	2	20	114	54	385
Length laid or relaid in 1936 (feet)	–	–	–	616	13	–	219	19	867
Valves in same	–	–	–	3	–	–	2	1	6
Length abandoned in 1936 (feet)	–	–	–	4	–	–	184	–	188
Valves in same	–	–	–	–	–	–	1	–	1
Total length in use Dec. 31, 1936 (feet)	352	292	4,270	8,318	233	1,315	4,783	1,947	21,510 [1]
Valves in same	–	–	60	138	2	20	115	55	390

[1] 4.07 miles.

TABLE No. 21. — *Length of Metropolitan Water Works Main Lines and Connections and Water Pipes, Four Inches in Diameter and Larger, in the Several Cities and Towns in the Metropolitan Water District, December 31, 1936*

By Whom Owned	Diameter of Pipes in Inches																			Totals	
	60	56	54	48	42	40	38	36	30	24	20	18	16	14	12	10	8	6	4	Feet	Miles
Met. Water Wks.	130,179	17,634	13,486	228,682	11,733	6,887	7,274	64,091	78,375	101,572	151,261	–	79,764	26	29,975	724	1,964	1,210	58	924,895	175.17
Arlington	–	–	–	–	–	–	–	–	–	–	–	–	2,388	–	46,168	38,197	112,999	257,009	1,196	457,957	86.73
Belmont	–	–	–	–	–	–	–	–	–	–	–	–	–	–	15,922	50,176	84,775	214,807	–	365,680	69.26
Boston	–	–	–	41,385	15,980	9,599	–	44,448	90,623	83,549	93,987	–	317,846	1,900	1,747,514	453,386	1,133,302	1,032,104	68,934	5,134,557	972.45
Brookline	–	–	–	–	–	–	–	–	–	10,007	27,292	–	26,395	12,880	66,387	86,643	111,673	278,279	31	619,587	117.35
Chelsea	–	–	–	–	–	–	–	–	–	–	4,517	–	4,675	–	6,012	43,197	36,517	159,847	1,521	256,286	48.54
Everett	–	–	–	–	–	–	–	–	–	2,484	2,900	–	6,948	6,619	8,306	47,790	40,543	177,632	18,946	312,168	59.12
Lexington	–	–	–	–	–	–	–	–	–	–	–	–	4,382	–	47,158	17,548	72,826	195,256	25,113	362,283	68.61
Malden	–	–	–	–	–	–	–	–	–	–	–	–	12,759	11,142	99,376	38,493	122,400	236,562	45,251	565,983	107.19
Medford	–	–	–	–	–	–	–	–	–	–	673	–	6,775	9,598	45,486	49,843	143,216	307,998	2,030	565,619	107.13
Melrose	–	–	–	–	–	–	–	–	–	–	–	–	12,464	3,024	26,223	27,200	29,005	212,254	48,008	358,178	67.84
Milton	–	–	–	–	–	–	–	–	–	–	–	–	4,579	72	92,767	23,989	95,332	233,985	8,322	459,046	86.94
Nahant	–	–	–	–	–	–	–	–	–	–	–	–	–	10,444	5,550	11,550	13,643	39,186	58,068	138,441	26.22
Newton	–	–	–	–	–	–	–	–	–	–	36,250	–	15,023	–	111,904	8,410	214,912	737,697	56,122	1,180,318	223.55
Quincy	–	–	–	–	–	–	–	–	–	–	15,542	–	35,648	–	83,813	102,513	256,676	454,217	61,128	1,009,537	191.20
Revere	–	–	–	–	–	–	–	–	–	–	–	–	10,600	7,416	39,343	36,069	77,133	152,120	55,155	377,836	71.56
Somerville	–	–	–	–	–	–	–	–	–	–	5,577	367	10,094	7,942	127,041	97,996	114,654	202,433	15,229	581,333	110.10
Stoneham	–	–	–	–	–	–	–	–	–	–	–	–	–	–	10,725	13,539	25,053	115,730	18,503	183,550	34.76
Swampscott	–	–	–	–	–	–	–	–	–	–	–	–	–	3,721	6,714	21,800	7,375	121,394	5,534	166,538	31.54
Watertown	–	–	–	–	–	–	–	–	–	–	–	–	2,991	6,750	13,939	48,972	95,468	178,220	3,782	350,122	66.31
Winthrop	–	–	–	–	–	–	–	–	–	–	5,151	–	4,327	–	5,302	24,198	87,753	53,548	13,845	194,124	36.77
Total feet	130,179	17,634	13,486	270,067	27,713	16,486	7,274	108,539	168,998	197,612	343,150	367	557,658	81,534	2,635,625	1,242,233	2,877,219	5,361,488	506,776	14,564,038	–
Total miles	24.65	3.34	2.55	51.15	5.25	3.12	1.38	20.56	32.01	37.43	64.99	0.07	105.62	15.44	499.17	235.27	544.93	1,015.43	95.98	–	2,758.34

TABLE No. 22. — *Number of Service Pipes, Meters, Per Cent of Services Metered, Fire Services and Fire Hydrants in the Several Cities and Towns in the Metropolitan Water District, December 31, 1936.*

CITY OR TOWN	Services	Meters	Per Cent of Services Metered	Services Used for Fire Purposes Only	Fire Hydrants
Arlington	7,490	7,488	99.97	33	890
Belmont	4,971	4,971	100.00	12	516
Boston	101,608	101,608	100.00	3,116	12,106
Chelsea	5,720	5,720	100.00	148	392
Everett	7,407	7,407	100.00	55	633
Lexington	2,574	2,574	100.00	17	537
Malden	9,742	9,742	100.00	74	739
Medford	10,721	10,721	100.00	35	1,092
Melrose	6,148	6,148	100.00	25	478
Milton	4,393	4,393	100.00	8	731
Nahant	919	919	100.00	2	146
Quincy	17,073	17,073	100.00	53	1,813
Revere	6,433	6,424	99.86	12	492
Somerville	13,919	13,761	98.86	127	1,417
Stoneham	2,437	2,437	100.00	3	198
Swampscott	2,777	2,777	100.00	6	288
Watertown	6,149	6,149	100.00	43	715
Winthrop	3,880	3,880	100.00	6	388
District Supplied	214,361	214,192	99.92	3,775	23,571
Brookline	8,176	8,171	99.94	48	1,166
Newton	15,492	15,492	100.00	100	1,694
Total District	238,029	237,855	99.93	3,923	26,431

TABLE No. 23. — *Elevation of the Hydraulic Grade Line, in Feet, above Boston City Base for Each Month at Stations on Metropolitan Water Works during 1936*

1936 MONTH	LOW SERVICE															
	WATERTOWN, PLEASANT STREET AT WALTHAM LINE		BELMONT, WATER WORKS SHOP, WAVERLEY STREET		BOSTON, BOWDOIN SQUARE ENGINE HOUSE		ALLSTON, ENGINE HOUSE, HARVARD STREET		MEDFORD, NEAR MYSTIC RESERVOIR		SOMERVILLE, PUBLIC LIBRARY, HIGHLAND AVENUE		MALDEN, WATER WORKS SHOP, GREEN STREET		CHELSEA, COURT HOUSE	
	Maximum	Minimum	Maximum	Minimum	Maximum	Minimum	Maximum	Minimum	Maximum	Minimum	Maximum	Minimum	Maximum	Minimum	Maximum	Minimum
January	196	191	192	178	150	141	176	167	171	162	165	153	166	155	158	142
February	195	188	194	178	150	141	175	167	168	162	164	155	166	158	155	143
March	196	188	192	176	150	141	175	169	171	162	165	156	165	158	158	146
April	196	191	194	176	152	143	175	168	168	162	167	156	165	156	158	137
May	195	191	194	176	152	141	175	168	169	161	168	157	166	158	158	135
June	194	188	192	164	150	141	178	168	169	162	168	157	166	158	158	142
July	193	186	192	171	150	138	178	170	168	162	168	157	166	158	158	142
August	194	186	192	157	150	138	177	170	168	162	168	157	166	158	158	130
September	195	191	192	170	152	137	176	170	168	162	169	157	166	157	155	132
October	196	191	192	170	150	141	176	170	166	161	167	157	166	156	158	130
November	194	191	194	170	150	136	176	170	166	161	165	157	167	155	158	135
December	193	188	187	171	150	134	176	170	168	161	167	160	167	156	158	143
Averages	195	189	192	171	151	139	176	169	168	162	167	157	166	157	158	138

TABLE No. 23. — Concluded — *Elevation of the Hydraulic Grade Line, in Feet, above Boston City Base, etc.*

1936 MONTH	SOUTHERN HIGH SERVICE								NORTHERN HIGH SERVICE								NORTHERN EXTRA HIGH SERVICE	
	BOSTON, BOWDOIN SQUARE ENGINE HOUSE		MILTON, ADAMS STREET AT CANTON AVENUE		QUINCY, FORBES HILL TOWER		QUINCY, WATER WORKS SHOP		SOMERVILLE, BROADWAY AT CEDAR ST.		REVERE, WATER WORKS SHOP, BROADWAY		LYNN, ENGINE HOUSE, UNION SQUARE		WINTHROP, TOWN HALL, HERMAN STREET		LEXINGTON, MASSACHUSETTS AVE. AT ARLINGTON LINE	
	Maximum	Minimum	Maximum	Minimum	Maximum	Minimum	Maximum	Minimum	Maximum	Minimum	Maximum	Minimum	Maximum	Minimum	Maximum	Minimum	Maximum	Minimum
January	245	219	246	221	242	212	242	212	258	237	269	244	266	243	198	189	441	432
February	245	227	246	223	242	215	242	212	258	233	269	253	265	252	199	189	441	427
March	245	227	246	224	244	217	244	214	258	235	267	244	265	243	198	188	436	425
April	245	228	247	226	244	219	244	214	260	237	269	248	266	247	199	177	436	425
May	245	226	246	216	244	207	244	202	263	233	269	251	266	229	191	175	436	415
June	245	224	246	209	243	199	242	189	263	217	267	241	261	217	189	176	436	411
July	242	217	246	202	242	190	242	189	258	203	269	235	259	190	191	157	436	406
August	242	217	244	214	240	197	239	182	254	205	269	235	254	201	188	168	427	390
September	245	224	246	221	240	213	238	207	256	230	267	251	254	233	188	182	432	415
October	245	226	246	222	244	216	243	209	263	233	267	253	263	228	189	184	434	422
November	247	228	246	224	244	214	242	209	263	237	267	253	263	217	198	184	432	411
December	245	228	246	221	245	215	242	207	265	240	269	253	266	252	199	184	422	410
Averages	245	224	246	219	243	210	242	204	260	228	268	247	262	229	194	179	434	416

Appendix No. 6

Information relating to areas, populations, local sewer connections and other data for the Metropolitan sewerage districts appears in the following table:

North Metropolitan Sewerage District

Area (Square Miles)	Estimated Total Population	Miles of Local Sewer Connected	Estimated Population Contributing Sewage	Ratio of Contributing Population to Total Population (Per Cent)	Connections made with Metropolitan Sewers	
					Public	Special
101.49	748,840	1,009.96	669,100	89.35	391	754
South Metropolitan Sewerage District						
208.52	741,780	1,072.70	538,540	72.60	220	89
Both Metropolitan Sewerage Districts						
310.01	1,490,620	2,082.66	1,207,640	81.02	611	843

Of the estimated gross population of 1,490,620 on December 31, 1936, 1,207,640 representing 81.02 per cent, were on that date contributing sewage to the Metropolitan sewers, through a total length of 2,082.66 miles of local sewers owned by the individual cities and towns of the districts.

These sewers are connected with the Metropolitan Systems by 611 public and 843 special connections. During the current year there has been an increase of 26.13 miles of local sewers connected with the Metropolitan Systems, and 7 public and 4 special connections have been added.

North Metropolitan Sewerage System

Location, Length and Sizes of Sewers, with Public and Special Connections

City or Town	Size of Sewers	Length in Miles	Public Connections, December 31, 1936	Special Connections	
				Character or Location of Connection	Number in
Boston:					
Deer Island	4′0″ to 9′0″	1.653	4	Doctor's House	
				Shoe Factory	
East Boston	9′0″ to 1′0″	5.467	25	Middlebrook Wool-combing Co.	
				Maverick Mills	
				Navy Yard	
Charlestown	6′7″ x 7′5″ to 1′0″	3.292	15	Private building	
				H. P. Hood & Sons, Inc.	
				Club House	
Winthrop	9′0″	2.864	14	Fire Department station	
				Private building	
				Bakery	
				Restaurant	
				Rendering Works	
Chelsea	8′4″ x 9′2″ to 15″	5.230	14	Metropolitan Water Works blow-off	
				Chelsea Water Works blow-offs	
				Naval Hospital	
				U. S. Lighthouse Service	
				Metropolitan Water Works blow-off	
				Cameron Appliance Co.	
				Shultz-Goodwin Co.	
Everett	8′2″ x 8′10″ to 4′8″ x 5′1″	2.925	10	Andrews-Wasgatt Co.	
				National Metallic Bed Co.	
				Linoide Co.	1
				Factory	2
				New England Structural Co.	1
				Beacon Oil Co.	1
				Everett Factories and Terminal Corp.	1
Lexington [1]	1′3″ to 2′3″	.002	2	— — — —	—
				Metropolitan Water Works blow-offs	5
Malden	4′6″ x 4′10″ to 1′0″	5.844 [2]	38	Private buildings	240
				Factory	1
				Bakery	1
				Swift & Co.	1
				Holy Cross Cemetery office	1
				Private buildings	133
Melrose	4′6″ x 4′10″ to 10″	6.099 [4]	43	Factory	1
				Railroad station	1
				Park Department bath-house	1
				Bath-houses and Park buildings	1
				Harvard dormitories	2
				Slaughterhouse	1
Cambridge	5′2″ x 5′9″ to 1′3″	7.899	54	City Hospital	3
				Street Railway machine shop	1
				Private buildings	5
				Factory building	1
				Tannery	1
				Slaughterhouses (3)	1
				Carhouse	1
Somerville	6′5″ x 7′2″ to 10″	3.577	16	Somerville Water Works blow-off	1
				Street railway power house	1
				Stable	1
				Rendering works	1
				Railroad scale pit	1
				Private building	1

[1] The Metropolitan Sewers extend but a few feet into the town of Lexington.

[2] Includes 1.84 miles of sewer purchased from the city of Malden.

[3] Mostly buildings connected with sewers formerly belonging to city of Malden but later purchased by the Metropolitan Sewerage Commission in accordance with Chapter 215 of the Acts of 1898 and by the Metropolitan Water and Sewerage Board in accordance with Chapter 512 of the Acts of 1911 and made parts of the North Metropolitan Sewerage System.

[4] Includes 0.736 of a mile of sewer purchased from the city of Melrose.

[5] Mostly buildings connected with a sewer formerly belonging to the city of Melrose but later purchased by the Metropolitan Sewerage Commission in accordance with Chapter 414 of the Acts of 1896 and with a sewer extension built in accordance with Chapter 436 of the Acts of 1897 by the Metropolitan Sewerage Commission as an outlet for part of the town of Stoneham and made parts of the North Metropolitan Sewerage System.

North Metropolitan Sewerage System — *Concluded*

Location, Length and Sizes of Sewers, with Public and Special Connections — Concluded

City or Town	Size of Sewers	Length in Miles	Public Connections, December 31, 1936	Special Connections: Character or Location of Connection	Special Connections: Number in Operation
Medford	8′6″ x 8′6″ to 10″	9.105	28	Metropolitan Water Works blow-offs	8
				Armory building	1
				Private buildings	9
				Stable	1
				Police substation	1
				Tanneries	6
				Private buildings	13
				Gelatine factory	1
				Watch-hand factory	1
				Stable	1
Winchester	5′6″ x 5′9″ to 15″	13.346	35	Railroad station	3
				Felt works	1
				Town Hall	1
				Bay State Saw & Tool Co.	1
				Whitney Machine Co.	1
				Metropolitan Sewerage Division	1
Stoneham	3′0″ to 10″	3.498	12	Water and Sewer Department	1
				– – – –	–
Woburn	4′2″ x 4′5″ to 15″	1.551	4	Atlantic Gelatine Co.	1
				Glue factory	4
				Private building	1
				Private buildings	238[2]
				Railroad station	1
				Car house	3
				Post office	1
Arlington	3′0″ x 3′6″ to 10″	6.723[1]	67	Town of Arlington garage	1
				Town of Arlington workshop	1
				The Theodore Schwamb Co., Inc.	2
				Arlington Gas Light Co.	1
				Edison Transformer Station	1
				Arlington High School	1
				Laundry	1
Belmont	1′3″ to 2′6″	0.008	5	– – – –	–
Wakefield	3′0″ to 2′0″ x 2′3″	0.703	1	Private building	1
Revere	4′0″ to 15″	0.136	3	– – – –	–
Reading	1′4″ to 3′0″	0.055	1	– – – –	–
		79.977[3]	391		754

[1] Includes 2.631 miles of sewer purchased from the town of Arlington.
[2] Mostly buildings connected with a sewer formerly belonging to the town of Arlington but later purchased by the Metropolitan Sewerage Commission in accordance with Chapter 520 of the Acts of 1897 and made a part of the North Metropolitan Sewerage System.
[3] Includes 2.787 miles of Old Mystic Valley Sewer in Medford and Winchester, running parallel with the Metropolitan Sewer.

South Metropolitan Sewerage System

Location, Length and Sizes of Sewers, with Public and Special Connections

City or Town	Size of Sewers	Length in Miles	Public Connections, December 31, 1936	Special Connections: Character or Location of Connection	Special Connections: Number in Operation
Boston:				Tufts Medical School	1
				Private house	1
Back Bay	6′6″ to 3′9″	1.500[1]	17	Administration Building, Boston Park Department	1
				Simmons College Buildings	1
				Art Museum	2
				Prince District Elementary School	1
				Private building	2
Brighton	7′0″ to 12″	6.405[2]	16	Abattoir	3
				Boston & Albany Railroad yard	2

[1] Includes 0.355 of a mile of sewer purchased from the city of Boston.
[2] Includes 0.446 of a mile of pipe and concrete sewers built for the use of the city of Boston; also 0.026 of a mile of sewer purchased from the town of Watertown.

South Metropolitan Sewerage System — *Concluded*

Location, Length and Sizes of Sewers, with Public and Special Connections — Concluded

City or Town	Size of Sewers	Length in Miles	Public Connections, December 31, 1936	Special Connections	
				Character or Location of Connection	Number in Operation
Dorchester	3′ x 4′ to 2′6″ x 2′7″	2.870[1]	14	Chocolate works	2
				Machine shop	1
				Paper Mill	1
				Private buildings	4
				Edison Electric Company Station	1
Hyde Park	10′7″ x 11′7″ to 30″ pipe	4.543	20	Mattapan Paper Mills	2
				Private buildings	2
				Fairview Cemetery buildings	1
Roxbury	6′6″ x 7′ to 4′0″	1.430	–	– – – –	–
West Roxbury	9′3″ x 10′2″ to 12″	7.643	27	Caledonia Grove buildings	1
				Parental School	1
				Lutheran Evangelical Church	1
				The Whittemore Co.	1
				Private buildings	1
				M. D. C. Sub-station	7
Brookline	6′6″ x 7′0″ to 8″	2.540[2]	14	Private buildings	2
Dedham	4′ x 4′1″ to 2′9″ x 3′	5.012	10	Private buildings	2
				Dedham Carpet Mills	1
Hull[3]	60″ Pipe	0.750	–	– – – –	–
Milton	11′ x 12′ to 8″	7.127	37	Private buildings	4
Newton	5′3″ x 5′6″ to 1′3″	2.912	14	Private houses	16
				Laundry	1
Quincy	11′3″ x 12′6″ to 16″ pipe	8.738	30	Metropolitan Water Works blow-off	1
				Squantum schoolhouse	1
Waltham	3′6″ x 4′0″	0.001	1	– – – –	–
Watertown	4′2″ x 4′9″ to 12″	0.750[4]	8	Private building	2
				Factories	2
				Stanley Motor Carriage Co.	1
				Knights of Pythias building	1
Needham	2′0″ x 2′3″ to 2′3″ x 2′6″	4.921	1	Walker Gordon Co.	2
				Private buildings	7
Wellesley[5]	2′0″ x 2′3″	–	1	– – – –	–
Canton	4′6″ x 5′0″ to 20″	7.243	4	School house	1
				Private buildings	3
				Neponset Woolen Mills	1
Norwood	4′0″ x 4′3″ to 30″ pipe	2.844	3	Bird & Son, Inc.	1
Stoughton[5]	– – – –	–	1	– – – –	–
Walpole[5]	– – – –	–	1	– – – –	–
Braintree	30″ pipe	0.071	1	– – – –	–
Weymouth	4′9″ x 5′0″ to 30″ pipe	1.346	–	– – – –	–
		68.646	220		89

[1] Includes 1.24 miles of sewer purchased from the city of Boston.
[2] Includes 0.158 of a mile of pipe sewer built for the use of the town of Brookline.
[3] Hull is not a part of the Metropolitan Sewerage District.
[4] Includes 0.025 of a mile of sewer purchased from the town of Watertown.
[5] The Metropolitan Sewer extends but a few feet into the towns of Wellesley, Walpole, and Stoughton.

North Metropolitan Sewerage System

Table showing Cities and Towns delivering Sewage to this System; Approximate Miles of Sewers connected; Estimated Populations and Areas now contributing; Total Areas ultimately to contribute, and Present Populations on Such Areas; Ratios of Present Contributing Areas to Ultimate Areas, and Ratios of Populations now contributing to Present Total Populations.

(Populations estimated as of December 31, 1936)

Cities and Towns	Miles of Local Sewers Connected	Separate or Combined	Number of Connections with Local Sewers	Estimated Number of Persons Served by Each House Connection [1]	Estimated Population Now Contributing Sewage	Estimated Present Total Population	Estimated Area Now Contributing Sewage	Area Ultimately to Contribute Sewage	Ratio of Contributing Population to Present Total Population	Ratio of Contributing Area to Ultimate Area
							Sq. Miles	Sq. Miles	Per Cent	Per Cent
Boston (Deer Island)	0.70	Separate	–	–	890 [2]	890	–	–	–	–
Winthrop	33.88	Separate	3,926	4.33	17,000	17,060	1.43	1.61	99.65	88.82
Boston (East Boston)	35.96	Separate and combined	5,556	11.27	62,720	65,440	1.27	2.18	95.84	58.26
Chelsea	33.04	Separate and combined	4,869	8.36	40,700	41,340	1.23	2.07	98.45	59.42
Everett	55.59	Separate and combined	7,218	6.4	46,200	46,730	2.15	2.92	98.87	73.63
Malden	82.86	Separate	9,637	3.77	36,370	56,960	3.63	4.16	63.85	87.26
Melrose	52.50	Separate	5,258	4.44	23,350	24,720	2.29	3.81	94.46	60.11
Boston (Charlestown)	22.04	Separate and combined	5,619	5.11	28,710	28,790	0.67	1.27	99.72	52.76
Cambridge	155.78	Separate and combined	19,255	6.20	119,380	119,940	5.18	5.43	99.53	95.40
Somerville	111.25	Separate and combined	18,519	5.35	99,080	99,450	3.68	3.96	99.63	92.93
Medford	99.9	Separate	11,257	5.41	60,900	62,170	4.51	6.11	97.96	73.81
Winchester	44.0	Separate	2,890	4.53	13,090	13,650	2.06	5.31	95.90	38.79
Woburn	29.14	Separate	2,031	5.46	11,090	19,810	1.41	12.23	55.98	11.53
Stoneham	21.19	Separate	1,636	4.78	7,820	11,170	1.06	4.27	70.01	24.82
Arlington	69.79	Separate	6,513	5.57	36,280	39,570	3.05	4.73	91.69	64.48
Belmont	55.40	Separate	3,766	5.51	21,560 [3]	26,940	2.47	3.78	80.03	65.34
Wakefield	27.06	Separate	1,729	4.84	8,370	16,570	1.15	6.36	50.51	18.08
Lexington	18.24	Separate	814	4.32	3,520	11,370	0.97	15.98	30.96	6.07
Revere	50.49	Separate	5,430	5.48	29,760	35,170	2.57	5.55	84.62	46.31
Reading	11.15	Separate	549	4.20	2,310	11,100	0.54	9.76	20.81	5.53
Totals	1,009.96	– – –	116,472	5.74	669,100	748,840	41.32	101.49	89.35	40.71

[1] Estimated from Assessors' statement of the number of houses in each city or town on December 31, 1936 and the population from census of 1935.
[2] Estimated by Superintendent of the Institution on Deer Island.
[3] Including 2 connections with McLean Hospital, having an estimated population of 806.

South Metropolitan Sewerage System

Table showing Cities and Towns delivering Sewage to this System; Approximate Miles of Sewers connected; Estimated Populations and Areas now contributing; Total Areas ultimately to contribute, and Present Populations on Such Areas; Ratios of Present Contributing Areas to Ultimate Areas and Ratios of Populations now contributing to Present Total Populations.

(Populations estimated as of December 31, 1936)

Cities and Towns	Miles of Local Sewers Connected	Separate or Combined	Number of Connections with Local Sewers	Estimated Number of Persons Served by Each House Connection [1]	Estimated Population Now Contributing Sewage	Estimated Present Total Population	Estimated Area Now Contributing Sewage	Area Ultimately to Contribute Sewage	Ratio of Contributing Population to Present Total Population	Ratio of Contributing Area to Ultimate Area
							Sq. Miles	Sq. Miles	Per Cent	Per Cent
Boston (Back Bay)	27.84	Separate and combined	2,255	9.64	21,740	21,830	1.17	1.61	99.59	72.67
Boston (Brighton)	75.00	Separate and combined	6,034	11.65	70,300	73,780	3.41	3.74	95.28	91.18
Brookline	97.94	Separate and combined	7,607	6.72	51,120	51,500	4.61	5.35	99.26	86.17
Newton	194.18	Separate	13,534	4.64	62,800	66,500	9.52	16.00	94.45	59.50
Watertown	63.83	Separate	6,120	4.39	26,870	36,220	2.96	3.83	74.19	77.28
Waltham	64.97 [6]	Separate	5,436	4.61	27,340 [5]	43,390 [5]	3.64	11.40	63.01	31.93
Boston (Dorchester)	74.15	Separate and combined	8,425	8.10	68,240 [2]	71,770 [2]	2.98	4.89	95.08	60.94
Milton	36.27	Separate and combined	2,930	4.53	13,270 [2]	18,870 [2]	1.58	9.59	70.32	16.48
Boston (Hyde Park)	45.24	Separate	3,491	13.10	45,730	46,190	2.00	4.57	99.00	43.76
Dedham	24.28	Separate	1,576	4.49	7,080	15,470	1.16	9.66	45.77	12.01
Boston (Roxbury) [3]	–	–	–	–	–	73,350 [2]	–	1.23	–	–
Boston (West Roxbury)	99.29	Separate and combined	7,934	4.81	38,160 [4, 2]	38,960 [4, 2]	3.89	8.92	97.95	43.61
Quincy	148.82	Separate	13,118	5.96	78,180	78,990	5.88	11.46	98.97	51.31
Wellesley	42.48	Separate	1,881	4.16	7,820	14,190	2.22	9.89	55.11	22.45
Needham	17.69	Separate	767	4.25	3,260	12,240	0.88	11.44	26.63	7.69
Canton	2.69	Separate	296	4.88	1,440	6,800	0.16	17.84	21.18	0.90
Norwood	31.98	Separate	2,190	6.10	13,360	15,790	1.72	10.16	84.61	16.93
Stoughton	5.08	Separate	67	4.21	280	8,600	0.05	16.23	3.26	0.31
Walpole	7.46	Separate	79 [7]	4.69	370 [7]	7,520	0.27	20.81	4.92	1.30
Braintree	13.51	Separate	274	4.30	1,180	17,710	0.78	13.44	6.66	5.80
Weymouth	–	Separate	–	–	–	22,110	–	16.46	–	–
Totals	1,072.70	– – –	84,014	6.41	538,540	741,780	48.88	208.52	72.60	23.44

[1] Estimated from Assessors' statement of the number of houses in each city or town on December 31, 1936 and the population from census of 1935.

[2] Parts of Dorchester, Milton, Roxbury and West Roxbury which are situated within the South Metropolitan Sewerage District limits are tributary at present to Boston main drainage works.

[3] At present connected with Boston main drainage system.

[4] Including connection with the Boston State Hospital, having an estimated population of 3,067.

[5] Including connections with the Metropolitan State Hospital and the Middlesex County Tuberculosis Hospital, authorized by chapter 372 of the Acts of 1928 and chapter 373 of the Acts of 1929, having an estimated population of 2,279.

[6] Includes 3.65 miles of trunk sewer built by Waltham for the joint use of Waltham, Watertown, Metropolitan State Hospital, and Middlesex County Tuberculosis Hospital, authorized by Chapter 372 of the Acts of 1928 and Chapter 373 of the Acts of 1929.

[7] Includes 4 manufacturing plants.

Both Metropolitan Sewerage Systems

Table showing Areas delivering Sewage to both Systems; Approximate Miles of Sewers connected; Estimated Populations and Areas now contributing; Total Areas ultimately to contribute, and Present Populations on Such Areas. Ratios of Present Contributing Areas to Ultimate Areas, and Ratios of Populations now contributing to Present Total Populations.

(Populations estimated as of December 31, 1936)

Systems	Miles of Local Sewers Connected	Separate or Combined	Number of Connections with Local Sewers	Estimated Number of Persons Served by Each House Connection	Estimated Population Now Contributing Sewage	Estimated Present Total Population	Estimated Area Now Contributing Sewage	Area Ultimately to Contribute Sewage	Ratio of Contributing Population to Present Total Population	Ratio of Contributing Area to Ultimate Area
							Sq. Miles	Sq. Miles	Per Cent	Per Cent
North Metropolitan . .	1,009.96	Separate and combined	116,472	5.74	669,100	748,840	41.32	101.49	89.35	40.71
South Metropolitan . .	1,072.70	Separate and combined	84,014	6.41	538,540	741,780	48.88	208.52	72.60	23.44
Totals	2,082.66	– – –	200,486	6.02	1,207,640	1,490,620	90.20	310.01	81.02	29.10